PULP & PAPER INDUSTRY

MADISON BRANCH
U. S. DEPARTMENT OF AGRICULTURE
FOREST PRODUCTS LABORATORY
MADISON, WISCONSIN

VOL. 21 JANUARY, 1947 NO. 1

2883

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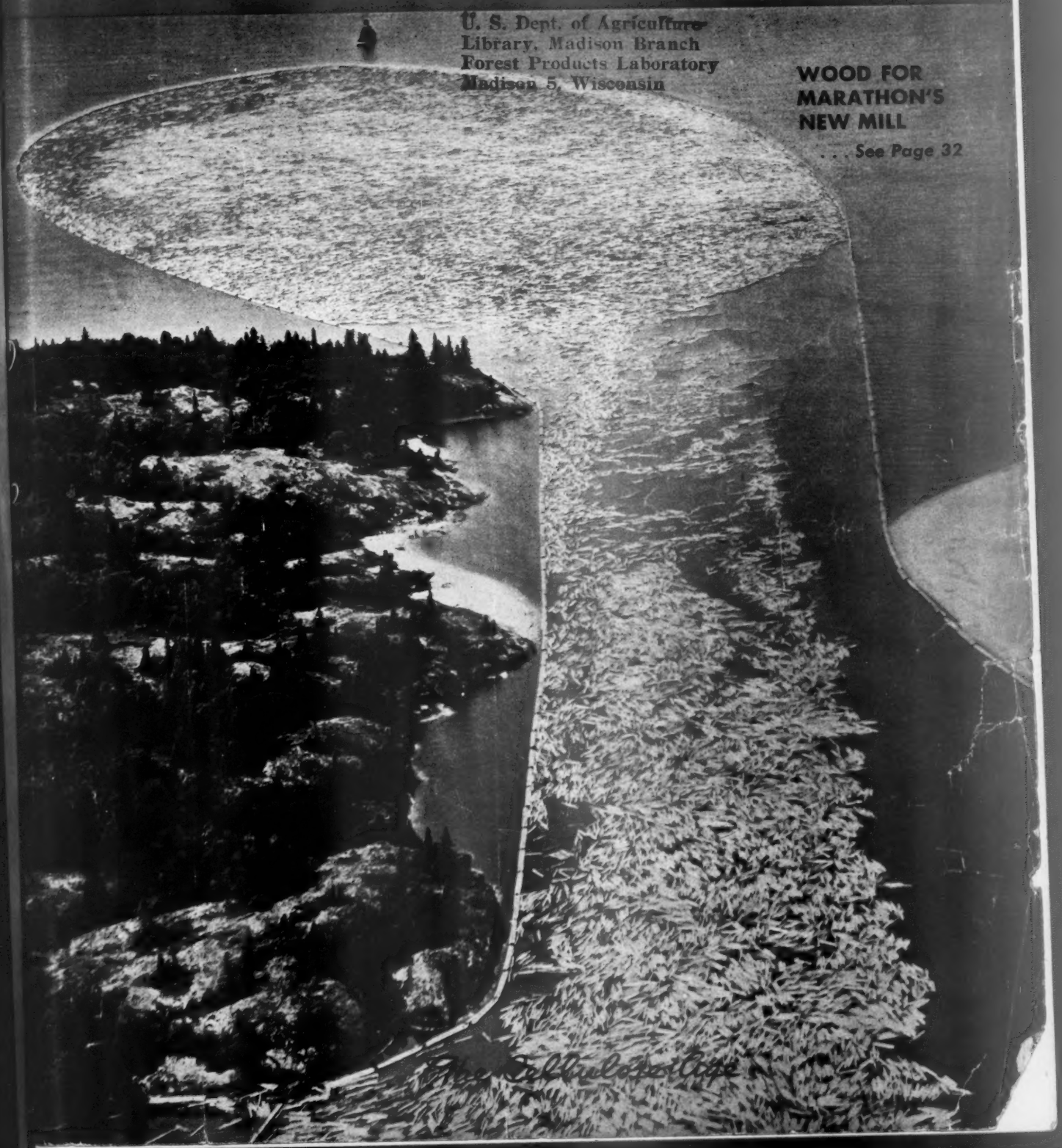
Madison 5, Wisconsin



WOOD FOR MARATHON'S NEW MILL

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"The Cellulose Age"

The Management Journal Covering North America's Wood Pulp, Paper and Cellulose Industries.

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January 1947 | Vol. 21 No. 1

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SUBSCRIPTION RATES

United States.....$2.00
Canada $2.00
Other Countries.....$3.00
Single Copies.....$ .35
Review Number.....$1.00

"We have achieved in this country a standard of living higher than will be achieved anywhere else in the world in the next century." — Ernst Mahler, Executive Vice President, Kimberly-Clark Corp.

Statement on Foreign Policy

A recent interesting address by Secretary of the Treasury Snyder before the Foreign Policy Association in New York officially enunciates the international trade policy of the present administration. In some respects it is quite a fling away from the past new deal policies, and the intriguing question is whether it is part of the much-discussed bi-partisan policy which may influence world pulp and paper trade even after 1948. He said:

"Now, ready to take over the longer range financing of reconstruction, ready because of the serious study given before the end of hostilities, is the International Bank for Reconstruction and Development.

"Positive steps are necessary to enable the world to gain its maximum development through a free exchange of trade, and the International Monetary Fund is now preparing to facilitate that development. The trade provisions of the Anglo-American Financial Agreement, and other efforts in the same field, such as the International Trade Organization, will contribute further to the expanding flow of commerce.

"It was recently my pleasure to preside, as chairman, at the annual meeting of the boards of governors of the International Bank for Reconstruction and Development and of the International Monetary Fund.

"Each of these institutions has distinct functions, but both have the common objective of a balanced world economy.

"Actually we cannot separate our concern for a stable economy at home from our concern for a stable world economy. A continuing prosperity in these United States in the long run will contribute more decidedly to world health than all the steps we have taken thus far.

"There are many elements of strength in our present situation that hold forth a promise of continued full production and wide distribution of goods, and of an expanding trade for a long period ahead. Current record earnings and the accumulated savings of our people represent a tremendous purchasing power. There is the demand for consumer goods, a vast, unsatisfied demand at home and throughout the world. There is the great potential expansion of our facilities for providing products and services for our own country and for export.

"As I have said before, I do not believe there is reason for a depression psychology. Most of our so-called obstacles to continuing economic well being will disappear if we will but submerge immediate self-interests and concentrate on long-range advantages.

"If we can match the elements of material stamina that exist in our country with an equal moral stamina, there need be no interruption of our era of progress. Then, our American system of democracy and free enterprise will carry us forward to new heights of prosperity at home, and to new heights of opportunity in the community of nations.

"I have a firm belief that the same system of free enterprise that made our own country strong and prosperous holds the greatest promise to the world for prosperity and peace."

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Two Big Meetings Set for May 22. See page 38.

JAP MILLS OPERATE AT 20% CAPACITY

Pulp and paper mills in Japan are presently operating at only about 20% of installed capacity, primarily because of (1) a coal shortage, and (2) lack of pulpwood.

There are 474 pulp and paper mills in Japan, but the great majority of them are very small units. However, there are some excellent mills and in many cases they are using ingenious ideas in their operations.

The above information comes from Dr. Harold R. Murdock, Asheville, N. C., paper industry consultant and formerly Champion's research director, who has been in Japan more than two months in his capacity as chief of the pulp and paper branch of the National Resources Section of General MacArthur's advisory staff.

Dr. Murdock's efforts to rehabilitate the Japanese paper industry, insofar as possible under the prohibition against non-military products, will be concentrated in larger mills. He meets with operators and technical men from one mill at a time; the emphasis of their discussions being on production and quality. Operators from smaller mills will be brought in later and shown what is being accomplished in the larger plants.

Dr. Murdock said the Japanese "have been very cordial and very anxious to learn."

"Tokyo is at least half destroyed from bombs and what a terrific sight!" he reports. "But it's a 'beautiful job' insofar as the military is concerned. The 14-mile drive from Tokyo to Yokohama shows no factories existing along both sides of railroads or highways. But the highways and bridges are intact. This was precision bombing at its best. It is the same story all over Japan."

Dr. Murdock is permanently billeted in a large Tokyo mansion with spacious gardens and grounds. He and seven other administrative experts are quartered there and they have 26 Japanese servants. His trip to Yokohama on a small troop transport, without lounge or recreation quarters, was a rough voyage—13 days out of Seattle.

GEORGE E. DYKE, elected in November as new President of National Paperboard Association. Mr. Dyke is President and Chairman of Robert Gair Co., Inc.

EDWARD E. DEN DOOVEN (left), whose appointment as General Superintendent of Northern Paper Mills, was reported in our last issue. Mr. DEN DOOVEN has been active in the industry and Supts. Association for many years.

C. ANDREE PERTAIN (right), certified public accountant, whose appointment to the staff of Northern Paper Mills in Green Bay, Wis., is also announced by President A. B. Hansen. Mr. Pertain was Captain, Finance Dept., Cost & Price Analysis Branch, U. S. Army Quartermaster Depot, Jersey City, N. J., during the war.

W. A. DELAHEY, of Toronto, who has been appointed Executive Vice President of the Great Lakes Paper Co., Ltd., Fort William, Ont., big groundwood-sulfite-newsprint mill. Hon. W. Earl Rowe is President.

Mr. Delahey was Pulpwood Controller for the Canadian Government during the war. He was former Manager of Ontario Forest Industries.

U. S. Record Production Despite Low Pulp Imports

Production of 1,750,896 tons of paper, paperboard and building board during October, according to U. S. Bureau of Census, broke all previous monthly records for the United States.

Wood pulp production in the U. S. was also reported at a new record level in October of 971,700 tons.

Significant is the fact that these records are made with pulp imports from Sweden and Finland far below expectations early this year. For 1946, these imports will be only around 500,000 tons compared with 616,000 tons in the 6-month shipping year of 1945.

Trained observers have advised PULP & PAPER INDUSTRY that Scandinavian pulp imports in the year 1947 are likely to again be under 600,000 tons, far below the 1,200,000 tons predicted for 1946 by the U. S. government early this year, which figure approximated the prewar imports from Scandinavia.

Bookpaper Market

Newsstand magazine circulations do not look as dark to publishers as they did two months ago, and this despite upping of retail rates on many titles. The leaders are holding well, or are on the upgrade.

Regular book publishers have much longer lists than in 1945, which was a record low. Sales continue to be fantastic, but the market has not yet been thoroughly tested on new prices.

Prices Post-OPA Are Steadying

Since PULP & PAPER INDUSTRY's December report on the price situation post-OPA there has been no appreciable change. Although there were isolated upward flurries soon after controls were removed, the industry as a whole has shown no inclination to go overboard. And, observers say, even the isolated flurries were in most instances justified and represent no more of a rise than OPA would eventually have allowed if it had remained in existence.

Appreciable price gains were noted, however, among the writing mills. Some have announced an increase of $25 per ton, although many have held to a self-imposed ceiling of $15 per ton increase.

The Swedes' dissatisfaction with their own government's export sailings have somewhat clouded the picture as to the future of pulp prices, but the air has been cleared to some extent by the Canadians' announced price for Jan. 1 of $115.00 on bleached pulp delivered.

The Swedish situation has kept some darkness over the domestic tendencies, but the move north of the border may,

it is believed, taper the Swedes off. As reported in these pages, the Finnish price of $165.00 on bleached and $132.50 on unbleached scared buyers off temporarily —but necessity won out, and this tonnage (said to be not more than 400 to 500 tons) was taken up.

New prices on pulp produced in Canada for sale in the United States became effective Dec. 2.

The revised quotations are: Bleached sulfite, $115 per ton, as against a former price of $107.50 a ton; unbleached sulfite, $100 per ton, against a previous price of $94; unbleached kraft, $95 per ton, against $89, and groundwood, $70 to $75.

On siderun news, the Canadians have advanced their price to $74 a ton.

Employment and Wages

There are 443,000 persons employed in the paper and allied products industries of the United States, according to recent employment data by the Bureau of Labor Statistics, including all full-time and part-time wage and salary workers. Production employes only are estimated at 366,000 persons.

Continued improvement in supply of labor available for both woods work and mill operations is reported. Some mills are spending sizable amounts in improving the food and the living quarters of woods workers.

For the first time in the history of the paper and allied products industries, average hourly earnings rose above $1, according to government figures. Average hourly earnings rose from 99.3 cents in June to 100.6 in July.

It should be pointed out, however, that hourly earnings in the paper and pulp industry were above $1 for the past five months and now stand at 105.2 cents. While the work week continues to decrease, take-home pay continues to rise to the highest levels on record. For paper and allied products, average weekly earnings total $43.10, although in the paper and pulp segment of the industry average weekly earnings rose to $46.02 (government data).

In Charge At Hull

L. Sterns, formerly in charge of construction for Canadian International Paper Co. at Gatineau, Que., has been appointed to a similar position with E. B. Eddy Co. in Hull, Que.

Boston Post Prefers Imports

IF WE import any kind of paper into these United States, maybe it is just as well that the trend is toward more imports of newsprint. This would leave American mills to concentrate on higher grades, bringing better prices and less unpleasant sabotaging of their efforts to meet costs and to protect their future existence and establish security for their employes.

The Boston (Mass.) Post seems to prefer imports. A Post official described a shipload of newsprint his company received from Finland as "superior to domestic newsprint." A lot of American paper companies are going to say: "That's okay by us."

Before Decontrol Day removed all restrictions, the newspaper publishers had approved only a $6 a ton increase for newsprint. Even the OPA overruled this unrealistic figure, and authorized a $10 boost.

We don't believe any newspapers published the fact that their spokesmen had fought for only a $6 boost.

MISS MARIAN E. SUTHERLAND, Secretary to Vice President Frank N. Youngman of Crown Zellerbach Corp., Portland, Ore., now on leave as Secretary to Deputy Chief of Staff of European Air Transport Service in Weisbaden, Germany, serving the Army of Occupation. Weisbaden is historic, medieval-like old German city.

MISS BETTY BARRY is Mr. Youngman's Acting Secretary. She's from Detroit and served in Europe in Red Cross.

Three Morgans in Row

When Howard Morgan, the newly appointed manager of the Pulp Division of Weyerhaeuser Timber Co., moved to Longview, Wash., from Munising, Mich., in December to occupy his new home there were three prominent Morgans living in a row on Longview's Nichols Boulevard.

The other two are Harry Morgan, manager of the Lumber Division of the same company, and Dr. Harry Morgan, a physician.

New Penn Salt Office Opened

LEROY M. SHANEMAN, who served in the U. S. Navy during war, is District Sales Manager of a new general district sales office of Pennsylvania Salt Manufacturing Co. of Washington, opened during December at 6400 Northwest Front St., Portland, Ore.

This is the site of the company's new modern chemical manufacturing plant, previously announced in this magazine, which will produce chemicals for the pulp and paper industry and other markets.

LeRoy Shaneman has been in the Tacoma, Wash., headquarters of his company, a subsidiary of Penn Salt of Philadelphia, since he completed Navy duties.

DURING THE WAR YEARS, paper company and pulpwood production executives throughout the U. S. and Canada became acquainted personally with BEN CANCELL, former chief of the War Production Board's Forest Products Bureau and earlier, a liaison officer for WPB in Canada. Here he is, in the wilds of British Colmubia with a seven-foot bear (it's quite dead), which he brought down with a rifle fitted with telescope sights. Mr. Cancell is now Vice President of Powell River Co., with offices in Vancouver, B. C.

SOUTHERN SUPERINTENDENTS DISCUSS RELATIONS WITH FOREMEN

Steam Efficiency and Refining Data are Other Topics

Foreman relations with both management and labor was the subject of one of the most important talks given at the joint convention of the Southern and Southeastern divisions of the American Pulp & Paper Mill Superintendents Association held at Jacksonville Nov. 14-16.

In our December issue we gave a preliminary report on the meeting, including the results of election of officers, and in this article is summary of papers and the talks.

It turned out that the subject of labor relations developed intriguing and widely discussed presentations at this Southern meeting, just as it had done in the National Convention at Poland Springs, Me., five months earlier.

Gordon R. Singletary, who had been promoted to the position of plant manager of Brunswick Pulp & Paper Co., Brunswick, Ga., just a month before, urged more attention to the selection and training of foremen. (Picture on Page 24.)

Raymond F. Bennett, national vice president and superintendent at Ecusta Paper Corp., Pisgah Forest, N. C., said "selling" the company to employes should be given more enlightened and expert attention.

Glen Amos, American Paper & Pulp Association industrial relations committee secretary, in a paper read by George Craigie, executive secretary of the Superintendents, advocated a "fair attitude" on both sides in handling of grievance cases.

Another subject which received heavy emphasis at the joint Southern meeting was ways and means of more efficiently operating mill equipment. How the exchange of information at these meetings helped bring this about was brought out by National President Homer H. Latimer, division manager of Champion's mill at Hamilton, O., who journeyed to Florida to keynote this convention.

The manipulation of steam and power, particularly at the machine end, was one of the most important and stimulating subjects of the entire convention. Increased efficiency in machine drying, as presented by a Chicago engineer, was a notable contribution.

Foremen and Labor Relations

Because the second day dealt in part with foremen and labor relations matters, of more general interest to all representatives of management, we present first a summary of those talks (Harry J. Kruse, Albemarle Paper Co., the new Southeastern first vice chairman, presided):

RICHARD HENRIK LAFTMAN, Vice President and General Manager, National Container Corp., Jacksonville, Fla., the "Host Mill" at joint convention of Southern and Southeastern Divisions of Supts. Association.

"Dick" Laftman was host at a Smorgasbord for delegates and wives on Nov. 14 and next evening he was Toastmaster at the big banquet.

Recently Mr. Laftman was awarded the King Christian Tenth Medal of Liberation by King of Denmark for activities in providing relief for Danish seamen stranded in Florida when war broke out in 1939 and 1940.

According to Mr. Singletary, foremen relations with both management and labor have been badly affected in the past few years because (1) of insufficient attention being paid to qualifications in selecting foremen, (2) failure of management to train foremen and post them on policies, and (3) dealing by hourly men through standing committees with the management with foremen "left out."

Selection of a foreman, said Mr. Singletary, should not necessarily be on the basis of "best operator" but, instead, because the man has proven leadership ability and is of the type managements want to represent it.

After a new foreman has been selected, do more for him than just letting him work with another foreman in the department, he urged. Take him through the accounting, personnel, technical and stores departments so he will be well versed in company business and materials costs. Then let him spend time with management and get its viewpoint.

Then, keep him informed so he can answer questions brought up by men under his supervision; hold regular foremen meetings—an evening dinner is best—to discuss matters and to keep foremen up to date; hold morning foremen sessions during union negotiations to benefit from their constructive thinking and, afterwards, their understanding effectuation of contract terms; and, never by-pass a foreman, letting all decisions of management reach the men through these management representatives.

The dominating need of the employer today is to list his employes as "sales objective number one," and if he can't handle the job personally get someone who can "sell" the company to the personnel; and just as hard as to a "best customer."

This could summarize the talk of Mr. Bennett of Ecusta, who opened the symposium on labor relations.

The educational and legislative approach to labor problems is always that the patient is very ill; the individual company should start on assumption that personnel relations are amenable, and work to keep them so. The inherent weakness of administrative approach effectuation or legislative approach to labor relations is that if there's no trouble the administrator will be out of a job.

The first undertaking of a company should be to sell to the employe the idea that management is an "all right guy" and not addicted to sharp tactics. The recreation program is useful, but management should not get carried away with "do gooder" enthusiasm and try to regulate employes' lives. Mr. Bennett reviewed "good boss" attributes; and what the employe needs to have a feeling of security in his job. A color movie made of an Ecusta Paper Corp. picnic by F. C. Huyck & Sons Co. representative, Walter Glass, was shown.

Without a fair attitude, the contract clauses for settling grievances

DELEGATES AT JACKSONVILLE CONVENTION:

Top row (left to right): LEE BAUER, Production Mgr., Ecusta Paper Corp., who was elected Second Vice Chairman of Southeastern Division of Supts.; RAYMOND F. BENNETT, Supt. Ecusta Paper Corp., who gave paper on labor relations (he is next National President of Supts. Assn.); ROLAND WILBUR and H. W. BORMAN, both of new Southern Paperboard Corp., being built at Savannah; "PADDY" ROSS of J. O. Ross Corp., and GARLAND SCOTT FRANCIS, of Carolina Paperboard Corp., Charlotte, N. C.

Second row (l. to r.): NORMAN U. DICKSON, Supt. of National Container who retired as Southern Chairman; WILLIAM T. WEBSTER, formerly of Tacoma, Wash., and Brunswick, Ga., mills, who recently became Assistant Gen. Mgr. at National Container, Jacksonville; A. T. TAYLOR, Bedford Pulp & Paper Corp., and EARL M. GUEST and R. C. RICHTER, of Nat. Container.

Third row (l. to r.): W. R. ROBBS, Jr., National Container; THOMAS C. JOHNSON, Union Bag & Paper Corp.; R. E. BERGSTROM, Swenson Evaporator Co.; G. E. JACKSON, Union Bag & Paper, and R. BATES WILSON, Continental Gin Co.

Fourth row (l. to r.): SAM M. BRATTON, Pusey & Jones Corp., who gave paper on headboxes and slices; J. W. SUTTLE, Southern Advance Bag & Paper Co.; DAN S. RION, National Oil Products; C. B. RHOADS, West Virginia Pulp & Paper Co., and SVEN FAHLGREN, Bird Machine Co.

NEW OFFICERS IN SOUTH:

ART SCHULTZ (top left), Supt. at Camp Mfg. Co., Franklin, Va., who was elected new Chairman of Southeastern Division, and PHIL J. HANNAN (top right), Chief Chemist, Southern Advance Bag & Paper Corp., Hodge, La., elected new Second Vice Chairman of Southern Division.

Below are Mr. and Mrs. HARRY J. KRUSE, of Richmond, Va. Mr. Kruse became new First Vice Chairman of Southeastern Supts.

Other officers are shown elsewhere or in pictures published last month. RAY ALMAND of Union Bag is new Chairman of Southern Division.

are useless, said Glen Amos in his paper. The handbook, "How to win grievances for the union, prepared by one organization, strikes directly at negotiations because if justice prevails there are no gainers, no losers. Mr. Amos noted failure of labor contracts to say foremen have power to settle grievances though the foreman can prevent grievances from "growing up." All grievances should be presented in writing; settled promptly.

(For a further analysis of the results of competition among unions by Mr. Amos, see PULP & PAPER INDUSTRY's report on the N. Y.-Canadian Superintendents meeting, page 24, Oct. 1946 issue.)

Value of Graphs in Management

Many mill executives may look at statistical reports day after day without slight variations making any impression, then suddenly discover the figures have strayed from a designated point. This point was made by Roger G. Nevin, National Container Corp., Jacksonville, Fla., in extolling mill activity picturization through the visibility of the graph. First giving an effective demonstration of graph making, Mr. Nevin proved his point with some of 96 graphs showing how National Container is performing.

Posting of a mill or department's production for the past month, year or any period as a straight line across the graph page shows up crossing and recrossing fluctuations as current production varies from day to day. Even the variation between shifts shows up. The overall steam analysis of digester, evaporator, recovery boilers, daily run in tons produced, pounds of steam per ton, all these, and other records show up in a form easily grasped. If a recovery boiler attendant starts letting the unit get clogged up, the results of his watch show up in a form he can readily see when shown.

Mr. Nevin showed how a rising trend in dryer steam can point to need of new felts; fluctuation of evaporator results may point to a clogged tube; and how digester operators' results can be compared. His graph on a close-down really looked as messy as it is. These

PARTICIPANTS IN JACKSONVILLE, Florida, meeting of two Divisions of Superintendents' Association in November, 1946. (All pictures by PULP & PAPER INDUSTRY magazine):

Top row (left to right): R. P. ABERCROMBIE, Cheney-Bigelow Wire Works; J. J. (Jack) WILLIAMS, Halifax Paper Co., Roanoke Rapids, N. C., and R. H. STEVENS, Tech. Dir., National Container Corp., Jacksonville (whose first job in the industry was under Mr. Williams); A. T. YODER, Ontonagon Fibre Corp., Ontonagon, Mich.; ROGER G. NEVIN, Nat. Container Corp., who talked on value of mill operation graphs; RUSSELL T. HUDSON, Union Bag & Paper Corp., Savannah; NAT NAVARRE, Orange Pulp & Paper Co., Orange, Tex., and JOHN CHANDLER, The Bristol Co., Waterbury, Conn.

Second row (left to right): MRS. JOE SCHEUERMANN. MR. SCHEUERMANN, Gen. Sales Mgr., Cameron Machine Co., and their daughter, MRS. DAENICKE; JIM W. RAINES, Lindsay Wire Weaving Co.; FRED DRAKE, Lockport Felt Co., and GENE BECHARD, representing Eastwood-Neally Corp. and Appleton Machine Co.

Third row (l. to r.): WALTER MOREHOUSE, National Oil Products Co., Harrison, N. J.; G. F. PARKS, Fitchburg Paper Co., Fitchburg, Mass.; J. F. NOBLE, Improved Paper Machinery Corp., and MRS. NOBLE; MRS. CAREY, who headed Ladies' Entertainment, and "Judge" W. M. CAREY, National Container Corp., who was Honorary General Chairman; and ALBERT VON KELLER, Industrial Relations Director, National Container Corp.

graphs, said Mr. Nevin, should be confined to two variables, one being time, with colors for emphasis and short reference tables as needed.

Also presented during the second day was a paper on synthetic rubber and there was an unprogrammed discussion of wire patch welding, which emphasized many of the points brought out in PULP & PAPER INDUSTRY'S article on this subject on page 20 of the April 1946 issue.

Sutherland Refiners

During the first day sessions, Charles A. Shoudy, from the Charleston, S. C., mill of West Virginia Pulp & Paper Co., presented interesting factual data on the results of the installation of a battery of ten Sutherland refiners at that mill.

These refiners (Sutherland Refiner Corp., Trenton, N. J.) are used for both primary and secondary refining serving the big Pusey & Jones Fourdrinier in making containerboard from two stocks of kraft pulp from the 500-ton pulp mill.

Mr. Shoudy stressed the point that he was not talking of Sutherland refiners versus jordans, but for the particular needs of that type of mill he held that when greater refining becomes a necessity, the disc refiners would reduce overall power consumption and make it unnecessary to purchase a new power generating unit.

In 1940 two Sutherland refiners were installed that cleared 74 tons per day with the use of 7.23 h.p., he said. This installation was expanded to provide seven Sutherlands and one jordan on primary stock, and the most recent change has been for complete installation of ten Sutherlands.

In summarizing the Sutherland refiner experience, Mr. Shoudy said that in measurement of capacity on 42-pound stock, the Sutherland is equivalent to 1.3 Noble and Wood jordans. One refiner on bottom stock accommodates 55 tons per day; on top stock 37 to 39 tons per day. While handling a greater capacity of stock, the Sutherland consumed 63 or 64% as much power as a jordan, he said.

In respect to maintenance, Mr. Shoudy said the jordan has an indeterminate life whereas the discs of the refiner must be changed every six months. Wear on top stock is 0.071 inches; on bottom stock, 0.062 inches. Development work in progress may improve this picture. It takes about 100 man-hours to change and grind a refiner disc, he said.

Development work in progress may improve the maintenance. General discussion brought out that an ammeter on each refiner is read hourly, the average being posted; the refiner product is more "leathery"; stock quality and amount is controlled (a) by pressure and (b) by power amperage; and that the North Carolina Pulp Co. mill at Plymouth, N. C., also is equipped with Sutherland refiners. This mill lists its products as "white paper boards" made from bleached and unbleached pine kraft pulp.

Jonsson Screens

Another piece of equipment discussed at the meeting was the Jonsson screen for knotting or other pulp screening supplied by Bird Machine Co., South Walpole, Mass.

Installation of Jonsson screens ahead of the washers, with removal of rejects before washing, produces a three-fold effect, according to R. C. Richter, National Container Corp.:

(1) Saving in salt cake;
(2) Saving in alum; and,
(3) Less foaming in the paper mill.

Results obtained in the mill so far indicate a salt cake saving of between 10 and 15 pounds per ton where salt cake utilization had run 40.5 pounds. Also reported was a drop of almost a full pH point after the brown stock chest.

Headbox and Slice

An interesting discussion on development, shapes and forms of head boxes and slices was precipitated by a paper presented by Sam M. Bratton, Pusey & Jones Corp.

Width of wire in relation to slice for faster machines proved intriguing, widening of the wire with feather edging of the deckler plate to eliminate the back wave being discussed. It was generally agreed that higher speed calls for wider wire in relation to trim sheet. Also emphasized was that slice must be retarded as speed increases, a definite experience on newsprint.

Mr. Bratton talked about an unidentified five screen book stock unit, as also the upward flow head box type.

Symposium on Drying at Jacksonville Meeting

Norman U. Dickson (National Container Corp.) presided over the Southern Division's first day symposium on drying that opened with an intriguing power balance talk by O. Winningham, of the same company.

Sandwiched between other mill structure in an ex-fertilizer plant, National Container's power unit suffers a space limitation problem, the meeting of which has resulted in the power men's being accepted as "part of the mill" and close watch by all hands of steam utilization. Accentuation of close control of electric power flow and steam use, unbalance of which is reflected in what goes to the condensers, has served as a key to economy, according to Mr. Winningham. The personnel's sensitiveness to this balance was summed up in an unnamed machine tender's boast that he was "the best power turbine operator in the mill."

In continuous operation are one 30,000-lb. bark-burner, one 60,000-lb. recovery boiler converted to bark burning, one 30,000-lb. recovery boiler, and one 80,000-lb. recovery boiler (one recovery boiler was used in the past). Steam balance is provided through use of one 100,000-lb.-hour oil-fired boiler. All boilers are operated at 400 lbs., 700 degrees Fah., and design prevents increased levels.

"Cat faces" containing concentration of slash and long-leaf pine rosin, as well as other wood unwanted for pulp-making are fed into a "hog" for fuel. The tabulation of steam in demand percentages and in finished board are as follows:

	Oil	*Black Liquor*	*Bark*	*Hogged Wood*	*Total*
Per Cent	36%	40%	18%	6%	100%
Per ton finished board	5400 lb.	6000 lb.	2700 lb.	900 lb.	15,000 lb.

On the basis of tabulations of steam flow rates in pounds per hour, with a 12.5 ton production, the following table was computed to give the consumption per ton of finished board.

	FLOW PER TON				*KWH Generated Per Ton*
	Throttle	*130-lb. Ext.*	*30-lb. Ext.*	*To Condenser*	
Turbine No. 1	6,744	.....	7,200	1,544	423
Turbine No. 2	4,296	4,296	.....	.....	77
Feed Pump	640	.....	640	.....	.....
Other Aux.	1,320	204	760	.....	.....
Totals	15,000	4,500	8,600	1,544	500

Steam requirements for the mill include 5,000 to paper machine, 3,000 to evaporators, 3,000 to digesters, 1,000 to caustic house, 1,544 to condensors, 365 to ejectors, 1,050 to boiler blow-down, and 1,100 to feed water heating, or a total of 16,059. Of these amounts, the digesters, caustic house, ejectors, and boiler blow-down are non-returnable. Gross requirements for feed water amount to 5,415 of treated make-up per ton of finished board, or 36%, which accounts for a large amount of heat. Steam returnable to condensors amounts to 10,644 as against a gross of 16,059 pounds per finished ton. The mill uses 1544 lbs. of steam per ton of production to the condensor to force steam-electric balance.

The mill has rebuilt its paper machine drainage system, thereby increasing drying capacity and production rate, all being reflected in better steam-electric balance. Major features of the daily report to top management include: Barrels of oil consumed per ton of production; Gross steam requirements of steam per ton of production; KWH per ton of production; Feed-water make-up expressed in percentage of gross steam requirements.

"Pulsating" Steam Flow

Technique of machine drying is being advanced to achieve a higher square inch rate than anticipated, said Paul Harrison, Velocity Steam Production Engineer. First National Bank Bldg., Chicago (3), in discussing "pulsating" heat. He referred to coming (and current) advancement in terms of forward steps of 1927 and the 1936 eras. Resistance in dryer roll drying comes 10% from cast iron wall, 5% from water film, and 85% from gaseous wall, he said. Pulsations of electric current under Ohm's Law increases flow one-third. In terms of steam, gains in terms of overcoming condensate resistance are 60 times as measured in terms of cast iron, and 1500 times in cast iron in overcoming gaseous resistance.

When steam pressure is pulsated by alternately passing exhaust steam and cold water over a thermostatic valve, the drop in pressure within the dryer roll causes an "explosion" of condensate into vapor with the release of latent heat. This creates zones of turbulence in the gas film, disturbing the heat resistance pattern. By pulsating the pressure, heat flow may be increased 7% to 10%. The National Container Corp. has one of these installations.

Going farther into drying, Mr. Harrison suggested higher pressure with more rapid drying rates on the last few rolls. He spoke of using as high as 150-pound steam in the end rolls with the aid of the Luckenwald steel jacket. Paper travel rate increases, good stock preparation and sheet formation, water removal efficiency in earlier stages of the machine were cited as factors to accompany the development. He predicted that advanced technique in expansions of latent capactities of existing mills would result in strong competitive conditions for new mills five years from now. Mr. Harrison's competent paper was backed by good illustrative material.

Use of a high pressure jet with pressure steam to re-circulate exhaust at renewed pressure was reported by Curt A. Young, development engineer, West Virginia Pulp & Paper Co. He asserted mills now in operation experience economic loss by throwing away low pressure steam then passing high pressure to intermediate stages.

The West Virginia mill, he said, has 35-pound designed dryers tested to 70 pounds. Proper authority was called, with approval of 60 pounds, steam use won. By passing 1.26 pounds of 150 pound pressure steam through a nozzle to draw in 1.00

THE HANDSOME WILKS FAMILY who were at social affairs of big Superintendents' Convention in Florida are shown in upper left of this group of pictures—they include Walter J. Wilks of St. Mary's Kraft Corp., St. Mary's, Ga.; Mrs. Wilks and their three daughters. At right of group is FRED E. AUGUSTINE, Gaylord Container Corp., Bogalusa, La.

Second row (left to right): R. W. McCORMICK, National Container Corp.; PAUL HARRISON, of Velocity Steam Production Engineering, Chicago, who gave paper on "Pulsating Steam Flow—key to more production"; GEORGE WITHAM, Orr Felt & Blanket Co.; H. M. BIXBY, Hercules Powder Co.; B. B. PIERCE, Chief Engineer, Gaylord Container Corp., Bogalusa, and R. E. PHINNEY, Chief Engineer, Container Corp. of America, Fernandina, Fla., who with A. H. STIER, Timber Mgr., welcomed delegates on Fernandina mill tour preceded by a shore dinner given by that company.

pound of 35 pound steam, the re-use of the latter resulted in a differential of 5c in fuel savings that amounted to $19,000 per year of 8,500 hours on installation costing $10,000 complete.

Combination of 1.62 units of 200-lb. steam with 1.00 unit of 35-lb. steam yields 60-lb. steam at the dryers. At higher pressures, 51,000 lbs. of 400-lb. steam and 49,000 lbs. of 35-lb. steam will yield 60-lb. steam. Low pressure steam is drawn from the discharge side separator and entraining begins at 70 per cent of high pressure and 50% of entraining (low) steam pressure. The mechanical arrangement is not variable but must be worked to design. Multiple units are more efficacious than a single unit. In stepping up steam from 35 lbs. to 60 lbs. at the dryers an increase of 14% of drying capacity is realized.

Earl L. Hobaugh, St. Joe Paper Co., prepared an excellent paper on a mill's setting up standards of results from current operational methods for determination of results of variations from such practices. The paper was read for him by W. M. Ebersole, of the same company. This is considered of special value in "speed-up" of machines, which is being accentuated. The St. Joe study was to establish a "base line" for water drainage ratae. Standards were set up on 42-lb. liner board, which comprises a large percentage of the mill's production.

Since it was concluded unfeasible to measure the water, the standard set up was to measure weight of bone-dry fiber passing over a given point, the consistency, and white water ratio. Established sampling methods were used. The machine speed was 940 feet per minute; production, 18.83 tons per hour; width at reel, 199 inches; bone dry basis on leaving wire, 36.19 lbs.-M. Sq. feet; white water, 0.0576%; pH, 6.5; temperature, 104 degrees F.; bone dry production, 17.474 tons per hour; freeness, 435.

The following table shows what was established as standard under conditions laid down:

WATER AND STOCK FLOWS

Location—	*Consistency*	*Bone Dry Stock. Tons/Hr.*	*Water With Stock*		*Water Removal*		*Fiber to White Water*
			Tons Per Hr.	*G.P.M.*	*Tons Per Hr.*	*G.P.M.*	
Head Box	0.50	19.715	3923.3	15693	.....	.....	.....
After Table Rolls	1.57	18.109	1135.3	4541	2787.9	11151.6	1.606
After Flat Boxes	15.2	17.511	97.7	391	1037.6	4150.4	0.598
After Couch	21.2	17.492	65.0	260	32.7	130.8	0.019
After Presses	34.0	17.474	33.9	136	31.1	124.4	0.018
After Dryers	7.2% Moist.	17.474	1.356	5.4	32.544	130.2	.....
							2.241

DRAINAGE SUMMARY

	Gals. Per Min.	*Per Cent*
Total water to wire	15693	100
Breast roll and table rolls	11151.6	71.06
Flat boxes	4150.4	26.45
Couch	130.8	0.84
Presses	124.4	0.79
Dryers	130.2	0.85
Water remaining in sheet	5.4	0.03
	15692.8	100.00

Papers on Automatic Controls

Summed up by an excellent paper by J. Roy Almand, Union Bag & Paper Corp., the control regulator's importance lies in its consistency in final product. Union Bag tried out consistency controllers; has gone to them 100%. Today's mechanical regulation is the anthesis of "rule of thumb" and "secrectiveness" of the old days.

Mr. Almand's paper was read for him by Russell Hudson, same company. The company installed a 150-gallon per minute Bramer regulator of about 20 to 25% capacity for their refiners. Siphoning was overcome by box design. Stock is regulated to 3¾% to 4% consistency. Water ratio, controlling hardness or softness after refining is important to bag manufacturers in which production is against specification.

Permanent records obtained from automatic pH control make possible duplication of any stock, said Karl M. Guest, chief chemist, National Container Corp. Manual methods cannot be continuous, with time lapse in sample taking. Also measurement is by color against standard, admitting error of color selectivity. In using elector-metric control, the electrode assembly suspension must be close to admission point of chemicals. Use of automatic pH control eliminates shift variations; nullifies the tender who says he "can't run at that." You can set the mill pH control at 6.2 on board and get good results.

Jim Hayes OK Again

James Hayes, woods manager at Everett Pulp & Paper Co., Everett, Wash., who has represented his company at pulpwood meetings on the Coast, has fully recovered from his recent illness and has been back at the mill regularly for some time.

California U. S. Forester

Perry A. Thompson, veteran member of the Forest Service, U. S. Department of Agriculture, and chief of the division of fire control since 1942, is the new regional forester for Region 5 (California) headquarters in San Francisco.

Gaylord Man Dies

Otto P. Carter, sales manager of the mill division of Gaylord Container Corp., in charge of kraft bag and wrapping paper sales from the Louisiana mill, died in early December.

Leslie W. Gould was transferred from New York to St. Louis to succeed him.

EXECUTIVE changes recently announced by Sydney Roofing & Paper Co., Victoria, B. C., & subsidiaries (left to right): R. LOGAN MAYHEW, now Vice Pres. and M'ging Director; A. WELCH, Gen. Mgr. and Sec'y.-Treas., and P. W. FIELD, Gen. Sales Mgr.

EXPERIENCES WITH STEEL ALLOYS RELATED BEFORE COAST TAPPI

New types of stainless steel and other special steel alloys have been of great economic value to this industry in reducing maintenance costs and lost time.

"Miracle metals" developed in the next few years will, no doubt, be superior to even those developed during the war.

But—these steel alloys are by no means a "panacea" for all the corrosion "ills" of this industry. Laboratory tests can seldom be trusted, and only long experience in actual operations will determine their worth in each important or new application.

Those were the principal conclusions of one of the most searching and exhaustive round table discussions on the subject of "corrosion" held anywhere in this industry, which featured the Pacific Coast TAPPI meeting in Everett, Wash., on Dec. 3.

With a formidable array of talent on hand, representing not only mills and halls of learning, but also the leading American fabricators of these new alloys, it is no wonder that a discussion of nearly 2½ hours developed on this single subject, bringing forth a mixture of warm praise for stainless steel with some mild "debunking" of some popular ideas.

A real "down-to-earth" talk on corrosions of various alloys used in sulfite pulping and waste liquor disposal was provided by Glasgow-born J. G. H. "Jack" Ellis, a ranking Rayonier engineer for the past 17 years.

Management — represented by owners and operators as well as superintendents — and many engineers and technicians who could not be in Everett, would find much of real value and interest in the talk that Mr. Ellis gave, because it was a straightforward report of actual operating experiences, and included some amazing experiences, too.

Among his conclusions were: (1) At least one year's experience with different alloys is needed before choosing one for any important purpose, and (2) As far as the pulp and paper industry is concerned, the American Iron & Steel Institute's type classification numbers for alloy steels are no longer a sufficiently exact specification.

He spoke without script or even notes, but we are reporting his talk in detail in this article, because of the critical interest it holds for this industry. The interest in corrosion in the sulfite industry is enhanced particularly by the trend in both the United States and Canada toward substitution of ammonia, or magnesia, or other bases instead of the traditional calcium base for sulfite cooking, involving new experiments for concentration, utilization or disposal of the highly corrosive sulfite waste liquor.

Mr. Ellis said corrosive effect of ammonia base liquor as used in the sulfite pulping operation at the Shelton, Wash., mill of Rayonier Incorporated was basically the same as in the long-favored calcium base cooking system generally used in sulfite mills.

Harry H. Richmond, chief engineer, Electric Steel Foundry Co., Portland, Ore., was moderator of the corrosion round table. Prof, H. V. Tartar of the University of Washington prepared the way for Mr. Ellis's address by presenting a phys-

AT TAPPI meeting in Everett, Wash.:

Top row: The "Corrosion" Panel (left to right)—Harry H. Richmond, Chief Engineer, Electric Steel Foundry Co., who was Moderator; Jack Ellis, Engineer, Central Engineering Div., Rayonier Incorporated, and Prof. H. V. Tartar, University of Washington.

Middle row (left to right): Ed R. Barrett, Executive Administrator, Northwest Dist., A. O. Smith Corp.; Mr. Ellis and Mr. Richmond, across the table; Prof. Schultheis, the dinner speaker; N. O. Galteland of Tacoma (back to camera), and, at extreme right, G. H. Galloway, of Crown Z mill, Camas, the Section Chairman.

Below (l. to r.): R. S. Hatch, Research Director, Pulp Div., Weyerhaeuser Timber Co.; N. W. Coster, General Supt., Soundview Pulp Co.; Russ LeRoux, Manager, Everett Mill, Weyerhaeuser Timber Co., and Dr. H. K. Benson, head of Univ. of Wash. Chem. and Chem. Eng. School.

ical chemistry talk in which he enumerated the various established combinations of factors or conditions which cause corrosion. E. R. (Ed) Barrett, of A. O. Smith Corp., and Roger E. Chase, representing Duriron Co., also took part in the discussion.

This was preceded by presentation of the first Shilby Award contest paper for 1946-1947—"Determination of Beta and Gamma Cellulose in Wood Pulp" by Henry Edwards Becker, 32-year-old member of research department of Soundview Pulp Co., a University of Washington graduate in bacteriology and chemistry. Born in Everett, Mr. Becker first worked at Everett Pulp & Paper Co., and has been with Soundview in that city since 1941. He is married and has two children. The Shibley contest is open to young men in the Pacific Coast industry.

In his paper, he outlined his development of a volumetric oxidation procedure for determining the percentages of beta and gamma celluose in dissolving pulps. These percentages, as well as that of the highly desirable alpha cellulose are of primary importance to the marketers and users of dissolving pulps or pulps used for various cellulose derivatives.

In Mr. Becker's paper, he said his method overcame the inaccuracy of the gravimetric test and at the same time was reasonably rapid, simple and requiring only ordinary laboratory equipment. He reported elapsed time of tests of four samples as 2 hours, 23 minutes.

About 65 men attended the afternoon technical session, and this number was increased to 83 for the dinner in the evening, where Prof. Fredrich Schultheis, assistant director, Far Eastern Institute, University of Washington, discussed "Our Future in the Pacific," and answered many questions of his audience regarding current events in China and particularly the Communist-Nationalist conflict.

Geore H. Gallaway, assistant to the manager of paper manufacturing at Crown Zellerbach Corp., Camas, Wash., and chairman of the Coast TAPPI, presided at afternoon and evening meetings.

Dr. Tartar, who has a long list of publications on subjects relating to the corrosion discussion, said that the development of protective coatings and special alloys has greatly reduced losses by corrosion in the pulp and paper industry in recent years.

But he warned that in testing of

(Continued on page 52)

KRAFT BLEACHING IS TOPIC FOR COAST TAPPI ON JAN. 14

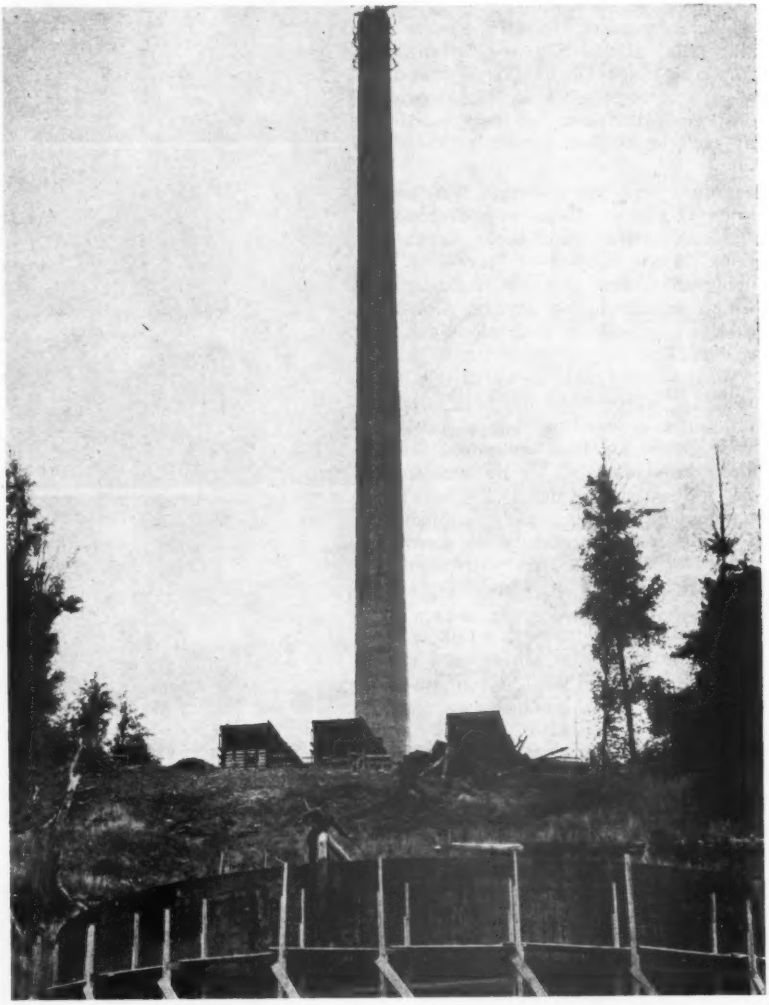
The next meeting of the Pacific Coast Section of TAPPI will be in Longview, Wash., on Tuesday, Jan. 14.

Chairman George Gallaway of Camas, Wash. (Crown Zellerbach Corp.), reports that by choice of the membership the subject for discussion will be kraft pulp bleaching. Devoting the meeting largely to one subject has proved popular on the Pacific Coast for the past two years.

Raymond Hatch, research director for the pulp division of Weyerhaeuser Timber Co., which is building a new sulfate mill in Longview, will be the moderator.

At the dinner meeting, a popular local speaker will be chosen.

Harold Wall, of Longview Fibre Co., and a member of Program Chairman Joseph McCarthy's committee, is making arrangements for the meeting.



HERE IS SULFITE WASTE LIQUOR DISPOSAL PLANT at Shelton, Wash., mill of Rayonier Incorporated, as it neared completion a year ago, which was referred to in the discussion of stainless steel by the Pacific Coast TAPPI.

The Shelton mill installed an ammonia sulfite pulp cooking system in place of orthodox calcium base, and disposes of waste liquor in three furnaces (an additional furnace has since been built) on this hillside directly above the mill.

Engineer Jack Ellis, in his talk before the Coast TAPPI, reported on these pages, said that experience with ammonia base cooking and disposal was still "limited" but that the corrosion problems were basically the same as in calcium base cooking. For any mill using high strength acids required in high quality pulps, the corrosion problem is a serious one.

This 360-ft. symmetrical stack reaches 535 feet above the sea level at the mill-side, higher than any stack in the Pacific Northwest emitting gases in upper air currents. Waste liquor from mill is pumped uphill to the 16x100 ft. concrete-brick furnaces where it is burned without leaving any residue. Mr. Ellis said there was still insufficient data on steel alloys used for handling this type of liquor.

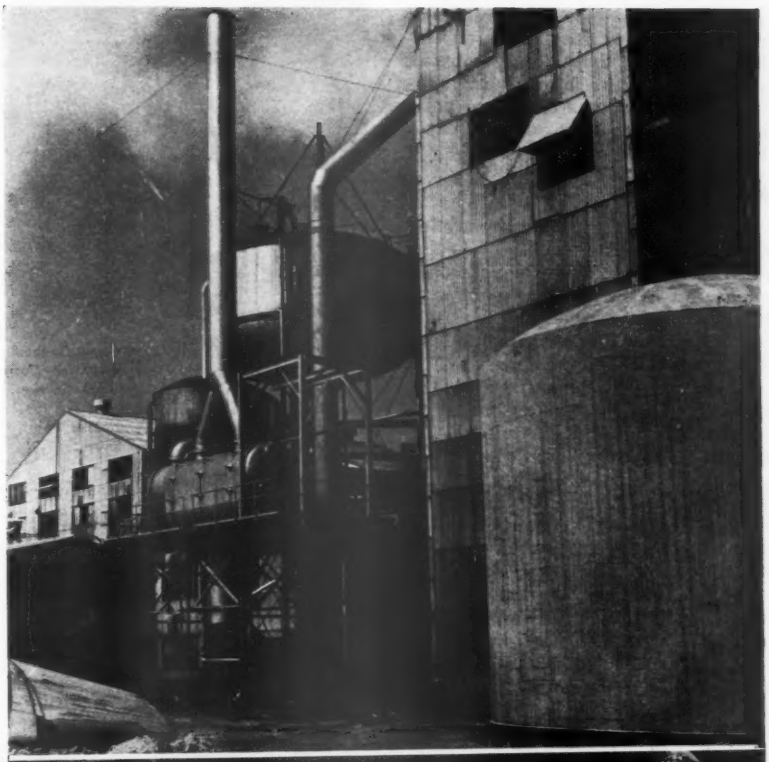
HOW A MILL IN GEORGIA IMPROVES ITS PULP QUALITY

WORK AND PLAY at Brunswick, Georgia, mill are depicted in these pictures.

Above—The new Foster Wheeler digester heat recovery system installation. The overhead tank for cold water storage supplies condenser at rate of 7800 gals. per minute. Tank is in background, mounted on structural steel. This eliminates need for large pump for circulating water, which passes through condenser under control of a system regulated by temperature. Cold water fed to upper tank is for makeup purposes only.

Impco bleach plant addition and other improvements help to "up" the product at Brunswick in quality.

Below—A couple of Brunswick Pulp & Paper Co. employes tie up their skiff at the pier during "off" hours. They catch fine fish right close to the job, which shows the mill and the fish get along together in this part of the country.



Improvement in the quality of pulp produced rather than increase in production has been the objective of the Brunswick Pulp & Paper Co., Brunswick, Georgia, in its million-dollar modernization program which has rapidly progressed toward completion in this important unit of the Southern pulp and paper industry. The bleached sulfate pulp capacity at this mill had previously been moved up from 150 to 250 tons daily and is divided between the Mead Corp. and Scott Paper Co.

E. J. Gayner III is the vice president and general manager and top resident executive at this mill. Promoted to be Mr. Gayner's right hand man (as we reported in November) is Gordon R. Singletary, now the plant manager, and a recent addition in the important post of technical director is Malcolm Pineo, formerly in Scott mills in Pennsylvania and on the Pacific Coast. This Brunswick mill—out on Atlantic flats a distance from the thriving town of Brunswick—is in one of the most highly productive areas of this industry and, at the same time, one of the most highly competitive pulpwood areas.

An extension of the bleach plant, including new Improved Paper Machinery Corp. washer equipment and a new chlorination stage, are important and effective additions for stepping up the quality of this mill's product. Another Dorr clarifying unit has been installed to increase the capacity of the causticising department and is operating satisfactorily.

A recently completed installation

which has afforded much satisfaction is a new digester heat recovery system. Since the production of the mill was increased, the heat recovery system had been inadequate. A hot process water softener system for treating boiler water to minimize maintenance has been another improvement. And a water treatment plant, an older installation of 18,000,000 gallons daily capacity, is all part of the picture in making Brunswick's product a better grade pulp, thereby putting Scott and Mead into better conversion markets.

Recovery Plant

For recovery, the company installed a complete Foster-Wheeler surface type condenser having 6500 square feet, with one inch steel tubes. The heat recovery on the basis of 25 blows in 24 hours amounts to 27 million B.T.U.'s per hour.

The water is heated from 80 degrees to 150 degrees Fahrenheit at an average continuous rate of 720 gallons per minute. This water goes to the bleach plant, the wash room, and the caustic house. The installation cost $45,000. The flow of water through the heat recovery system is controlled by automatic regulatory equipment furnished by the General Regulator Corp., and at the peak of the digester blow (when exchange of heat is maximum) water is passed at the rate of 7800 gallons per minute.

The factor that seems to appeal to the practical operating man is that the cold water flow to the condenser at the rate of 7800 g.p.m. is supplied from an overhead cold water storage tank, thus eliminating the need for a large pump for circulating water. The water passes through the condenser under control of a system regulated by temperature.

The new hot process water softener system has a capacity of 32,000 gallons per hour. It results in reduction of 200 parts per million to zero hardness in 2,200,000 pounds of water each 24 hours.

Equipment in this installation includes a sedimentation tank, a jet heater, a vent condenser, vacuum breakers, a chemical solvent tank, agitators, chemical proportional pumps, five filters, a deaerating heater of 320,000 pounds per hour capacity, and the requisite pumps.

E. J. GAYNER III, Vice President and General Manager of Brunswick Pulp & Paper Co., Brunswick, Ga. Under Mr. Gayner's direction, this mill has put into effect some of the most enlightened policies and most modern operational methods in vogue in the South.

GORDON R. SINGLETARY, Plant Manager at Brunswick Pulp & Paper Co. His leadership and ideas have helped to achieve the results in improving that mill's product, as described in this article, according to his superior, Vice President Gayner.

WALTER J. BROWN, Superintendent, Brunswick Pulp & Paper Co.

W. W. KRAUSS, Plant Engineer, Brunswick Pulp & Paper Co.

The pumping equipment includes an Ingersoll-Rand boiler feed pump of 600-gallon-per-minute capacity and 1415-foot head. It is operated by a 300 h.p. 3600 r.p.m., totally enclosed motor. There are four auxiliary pumps, two of which are turbine and two motor driven.

Additional brown stock storage tanks for doubling of current capacity, have been built.

The extension of the bleach plant, housing the new Impco washer equipment and a new chlorination stage, got underway last summer. Of special interest in the field of personnel is an elevator that will facilitate the movement of operating crews to and from the top of the bleach plant. All of this equipment is supplemental to already existing installations.

Also recently ccompleted and in use is a $70,000 storeroom building. Wood yard equipment acquired includes International Harvester track-type tractors and Kohring and Marion 25-ton cranes. In the woods end, Caterpillar tractors with Hyster winches are being acquired.

One feature of interest to engineers is that every building, regardless of weight, must rest on a foundation furnished by deep-driven piling, the mill being located on the edge of a river and in its estuary.

Of fairly recent construction is a concrete dock where a 30 to 34-foot depth channel can accommodate either a barge for delivery of pulp to inland waterway navigation or to deep-sea tonnage. Prior to the war,

the company received overseas shipments of as much as 2500 tons of salt cake from ships at this dock. The Willis Towing Co., Norfolk, Va., recently resumed contract movement of pulp from the mill to the Scott company plant at Chester, Pa.

Employes Enlisted

To make its entire mill staff quality "conscious," Brunswick Pulp & Paper Co. held a series of nine dinner meetings — every employe participating in at least one of them. Supervisors participated in more. The quality story was told; the employes were specifically shown how they could improve the mill product. Exhibits of products were part of the campaign.

As a result, Brunswick Pulp & Paper Co. has since not only made the highest quality pulp in its history but also has achieved its best production record.

Scott's Big Machine To Be Repaired By July

A paper machine which was damaged by an exploding dryer roll on Sept. 11, at Scott Paper Co., Chester, Pa., will be in operation by July, according to officials of the company. Meanwhile loss of production was considerably cut down by the use of a tissue machine for continuing towel production that had been interrupted by the accident.

The company has stated that it believes the property and production losses involved will be covered by the insurance covering property use and occupancy. Cause of the accident has not yet been determined, but the Scott officials claim pressures were lower than authorized and safety valves were in working order. The machine had been working satisfactorily up until the time of the accident. No loss of life resulted.

New Boiler Plant Going Up at Chester

To prevent temporary shutdowns for maintenance at the big Scott Paper Co. mill in Chester, Pa., construction has begun on a new $1,200,000 power plant with a 150,000 lbs. capacity steam boiler and auxiliary equipment.

The mill now has three steam boilers and three turbine generators.

AFL Unions Win and Lose

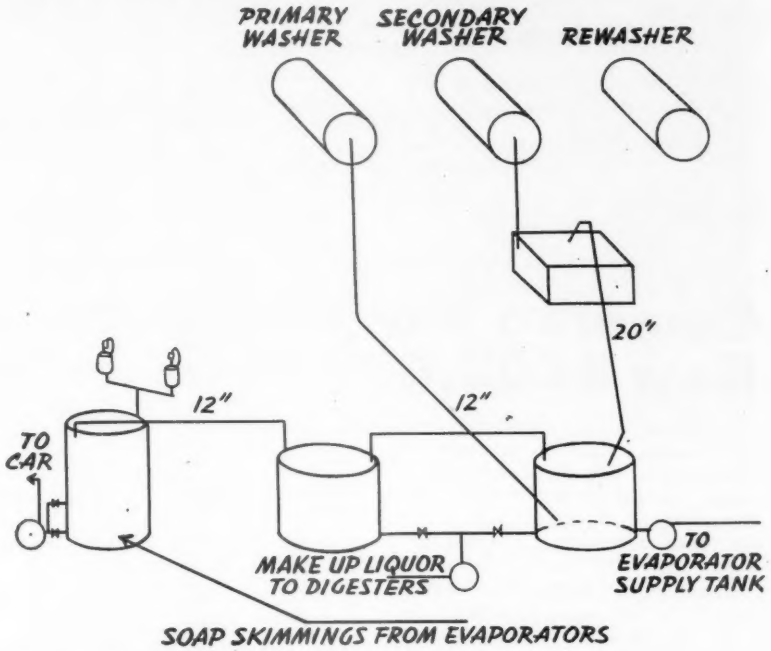
Fort Edward, N. Y., employes of the Marinette Paper Co., voted 111 to 178 against representation by the two AFL paper industry unions. The company's employes in Wisconsin — Marinette and Menominee mills—had previously voted in favor of the AFL unions by 230 to 174.

Okerlund Hurt Severely In Highway Accident

G. A. "Gus" Okerlund, personnel manager for Puget Sound Pulp and Timber Co., Bellingham, Wash., was convalescing last month from injuries received in an automobile accident on Thanksgiving evening.

His injuries consisted of severe cuts about the face and hands, a fractured jaw and three ribs cracked.

An Efficient Arrangement for Foam Breakers at Brunswick



SKETCH SHOWING SCHEMATIC ARRANGEMENT OF FOAM BREAKERS SYSTEM PROVIDED AT BRUNSWICK PULP & PAPER CO. BY IMPROVED PAPER MACHINERY CORP., NASHUA, N. H.

When Pulp & Paper Industry recently visited Brunswick Pulp & Paper Co., on the Georgia coast, it was found that excellent results are being obtained with foam breakers at that mill due largely to the placement of these devices.

Following a series of tests, it was determined that these Impco foam breakers achieved the maximum efficiency when placed at a most distant piont from the sources of the foam. With the foam breakers in this location, the foam must pass through successive tanks, and restrictions represented by the interconnecting piping before reaching the breaker.

The devices had been tested at various points in the system, but it developed that these alternate restrictions and releases of the foam removed a great deal of the liquor initially in the foam and hence, reduced the power on the foam breakers.

The final arrangement (see illustration above) is such that the foam from both the primary and secondary washers of the two-stage counter-current system, which are followed by a rewasher, is piped into the primary washer liquor tank which is 40 feet in diameter by 20 feet high. The top of this tank is vented through a restricted pipe into another tank of the same size (for settling only) and thence to a 30-foot diameter by 30-foot high combination foam, and soap-settling tank on the top of which the foam breakers are mounted.

In operation there is normally about 16 feet of liquor in the primary washer tank, and a pump delivers direct from this to the storage tank ahead of the evaporators. The pump supplying make-up liquor to the digesters is cross connected between each of the 40-foot tanks so that liquor at about 8 degrees Baume' (hot) can be withdrawn from either.

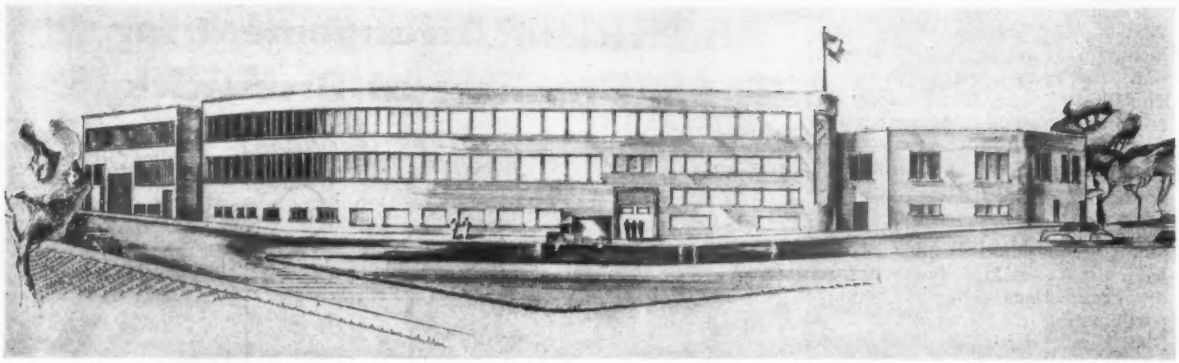
Soap skimmings from the evaporator room skimmer are delivered to the 30-foot diameter tank where they gradually concentrate. Liquor removed from the soap is pumped out of this tank once per day to the intermediate 40-foot tank. Soap at about 8 lbs. per gallon is pumped directly from the 30-foot tank through an upper connection to tank cars for shipment.

Each foam breaker is equipped with a 5 HP motor direct coupled to the machine.

Continuous System For Turpentine and Rosin

A new and more economical method for the production of turpentine and rosin is announced by the U. S. Department of Agriculture. It consists of putting preheated "gum" or sap from Southern pine into one end of a new type continuous steam still and taking off turpentine and rosin from separate points at the other end.

Research on this new continuous type steam still has been under way at the U. S. Naval Stores Station at Olustee, Fla. The new method is faster and cheaper than the "batch" method in general use today. It uses about one-third less steam than the most efficient steam still and begins to turn out turpentine and rosin about 5 minutes after gum enters the still. It produces rosin about a half grade better than can be produced on the best steam mill.



A WASH DRAWING of the new $400,000 Cameron Machine Company plant being built on Brooklyn Parkway on Long Island.

Cameron Machine Company Builds New $400,000 Plant in Brooklyn

After having served the pulp and paper industry through 40 progressive years, the Cameron Machine Company, 61 Poplar St., Brooklyn, N. Y., is getting set for the future with a new $400,000 factory.

Construction began in August, and W. B. Wilshusen, president, announced the plans officcially this month. The new plant is to be a two-story brick and steel building of modern design, with many up-to-date facilities for materials handling. Much of the wall areas will be glass, insuring a daylight plant in which considerable new machine tool equipment will be added to the present investment.

The new factory is in the same approximate location as the present plant, but the main factory entrance will be on Hicks and Fulton Streets facing the new Brooklyn Belt Parkway on which construction is soon to begin.

"The new plant is in a sense an expression of our faith in the future of the paper industry," Mr. Wilshusen said, "and it is also an effort to rearrange our manufacturing in order to better service this industry whose patronage over the past two decades is deeply appreciated in our organization."

Joining Mr. Wilshusen in making the announcement were Joseph S. Scheuermann, general sales manager, and H. E. Overacker, advertising and export manager. All three are well known to the pulp and paper industry for their long service with Cameron.

Cameron Machine is one of the historic establishments of Brooklyn, having started in a basement at 4th and Baltic Streets in 1906 by James A. Cameron whose father was also a mechanic. Very early in his career Mr. Cameron developed the basic Cameron principle of the pressure slitting and roll winding of paper, and the growth of the company and all its modern models are based on developments of this basic principle.

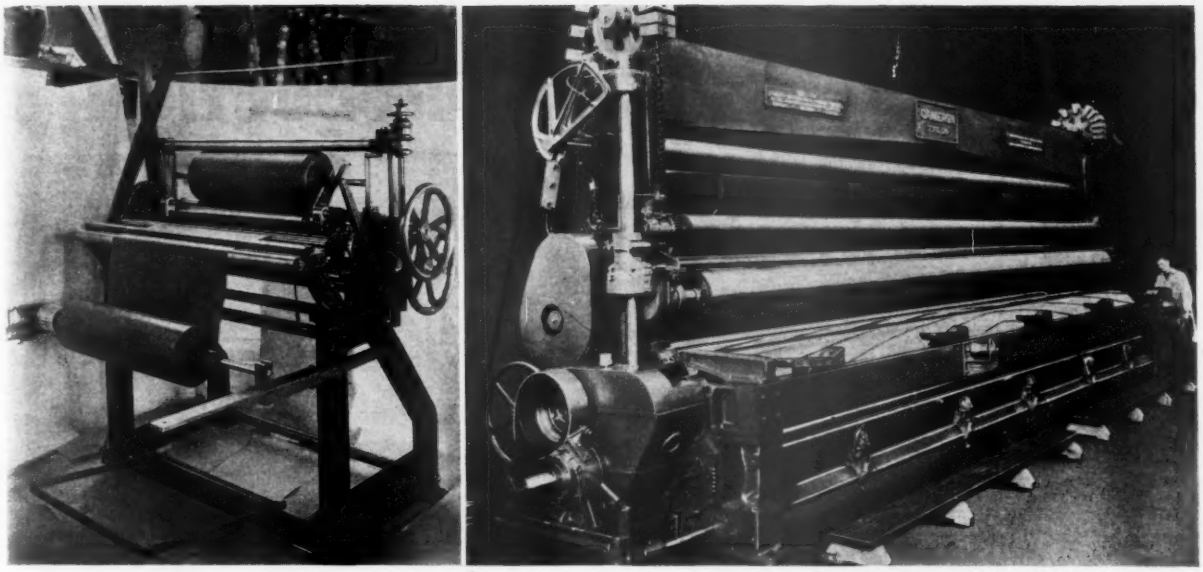
Left to right: JOSEPH S. SCHEUERMANN, General Sales Mgr.; W. B. WILSHUSEN, President, and H. E. OVERACKER, Advertising and Export Manager, of Cameron Machine Co. All three well known in pulp and paper field, they are here shown looking over plans for their new plant.

Soon the business had grown to such an extent that the property on and adjacent to 61 Poplar St. was purchased by the company. The present offices of the building are in what was erected as the Brooklyn Newsboys Home in 1886. After the first World War, an abandoned church on the property was converted into factory space, and other buildings were subsequently taken over.

Mr. Cameron devoted himself to the paper industry right from the beginning, and he was then, and the organization is said to be now, the only firm specializing exclusively in winders and slitters. When Cameron Machine Co. first began, the paper industry was not inclined to worry about the finished roll. But the founder and his successors have hammered steadily and successfully on the fact that "the package sells the goods" and that a good roll is as important as good paper. Today the winder is as important to the manufacturer as any other part of the paper machine set-up.

The first Cameron machine was a 42-inch model. Today there are 300-inch winders in operation, and the company has "Camachines" installed in every papermaking country in the world.

The present Cameron management has been with the company for many years. Mr. Wilshusen, for instance, joined Cameron in 1915. He



Left—the first Cameron machine—a 42-inch model. Right—one of the huge 300-inch "Camachines" which are now in operation. Note size of man at extreme right in comparison.

became president in 1934, a year after James Cameron's death. These men have seen and taken part in the developments in paper laminates, roll plastics, cellophane, waxed and greaseproof papers and other specialties. They have lived to see thousands of products fed from rolls, even metals.

Cameron starts its new building with an excellent war record behind it. The company built machines for aircraft production, shell containers, and made winders for the rolling of nitrating pulps. It also manufactured valves for the Navy, and ground bronze rudders for minelayers.

It enters peace-time production with more than 700 machines on order—$4,000,000—to add to the records of the 5,000 Cameron machines now in operation throughout the world. Despite this backlog of orders, Cameron maintains its service organization at top efficiency. In addition to the Brooklyn personnel, which handles the East and South, there is a Midwest office at 111 West Monroe St., Chicago; and the Far West is handled by the Pacific Coast Supply Co., Portland, Ore., and San Francisco. A subsidiary company, Cameron Machine Co. of Canada Ltd., with office at Montreal and manufacturing facilities at Dundas, handles Canadian business.

John P. Roche Joins Heppenstall

John P. Roche has joined the Heppenstall Co. of Pittsburgh, Bridgeport, Conn., and Detroit, manufacturer of chipper knives, as vice president and general manager of sales.

Western representative of this company is Ray Smythe, Park Bldg., Portland, Ore.

Dr. Rees of Huyck Tours Pacific Coast

Dr. E. A. Rees, director of felt sales and research for F. C. Huyck & Sons Co., Albany, N. Y., makers of Huyck and Kenwood felts, made a trip of several weeks to the Pacific Coast. He returned to Albany on Dec. 13 after visits in the Columbia-Willamette Valley area and in California.

His first trip to the coast in three years followed about three months after a tour by F. H. Eldridge, president and general manager of the Albany felt manufacturing firm.

Pacific Coast Supply Co., John Fulton, manager, represents this company on the Coast.

Kimberly-Clark Men Win Top Prizes

In an essay contest on the subject of how superintendents and foremen can best help management, Kimberly-Clark men won the three top awards in the Northwestern Superintendents' division. Roy Collar, Lakeview mill personnel department; Maurice Hunt, Badger-Globe personnel department, and Mark Jorgenson, Badger-Globe materials department, were the winners in that order.

Salmonson Operates Oregon Coast Resort

Sam A. Salmonson, formerly pulp superintendent in New York, Canadian and Washington state mills, is heading up a new resort and real estate development on Oregon coast at Lincoln Beach, three miles north of Depot Bay.

He's a neighbor now of Jim Fagan, another retired industry executive, who lives in the attractive fishing village of Depot Bay.

Power Court is the name of a "motel" operated by Mr. Salmonson with the assistance of his sons, Ray and Harry. Their address is "Rural Delivery, Depot Bay, Ore."

Murray & Tregurtha Units Added By Bowater's

Bowater's Newfoundland Pulp and Paper Mills, Ltd., at Corner Brook, Newfoundland, has placed orders for additional Murray & Tregurtha units for the various small craft operated by the company in connection with its pulpwood transport and other general services in Newfoundland.

A. W. Bentley, manager of the Bowater's woods department, advises PULP AND PAPER INDUSTRY that the company some time ago had a Murray & Tregurtha outboard engine 02 Model powered by a Chrysler gasoline engine installed on a wooden scow on which a diesel powered crane was mounted. This craft was used on various jobs around the waterfront of the mill at Corner Brook.

The unit gave such a satisfactory performance for more than a year that the company secured another Murray & Tregurtha engine, Model 02D, powered by a General Motors diesel engine. This has been used satisfactorily, moving a large wooden scow on which is mounted a diesel powered crane.

"This unit," writes Mr. Bentley, "was used in the bays on the northeast coast during the past summer. As a result of this work we have purchased ten units of the model 02D, and twenty units of the model 04 powered with gasoline engines. We expect to mount these units on wooden scows and steel pontoons and use them moving supplies and towing wood.

Two Companies Join At Christmas Dance

Soundview Pulp Co. and the Pulp Division of Weyerhaeuser Timber Co. in Everett, Wash., joined forces again in an unusual two-company Christmas party—a dinner dance Dec. 20 at the Elks Club. Office forces and all supervisors of the two mills are guests of the two companies. This is the third time for this unique affair.

NEW ONTARIO MILL PREPARES FOR FULL BLEACHED PULP PRODUCTION

PULP & PAPER INDUSTRY pictures taken by staff representative at new Marathon Paper Mills of Canada, Marathon, Ont.

Top (left to right): JAMES RUCK, formerly at Maine and Washington State mills, who is Operating Supt.; NILES M. ANDERSON, Vice President and Manager, shaking hands with GRANT ROSS, Chief Engineer and Assistant to Mr. Anderson, as they read the recording of the first cook from a Marathon digester on Sept. 20.
Lower row (left to right): HARRY STAFFORD, Chief Electrical Engineer; WILLIAM FEENEY and FRED PHILES, Assistant Supts.

SOME ten years ago D. Clark Everest, the head of Marathon Corporation, began dreaming about building a sulfate pulp mill in Canada to augment supplies for his company's Wisconsin operations.

Mr. Everest's dream comes true this January when the new, streamlined $15,000,000 bleached sulfate pulp mill of Marathon Paper Mills of Canada, on the Northern Ontario shore of Lake Superior, goes into full bleached pulp production.

In mid-December the mill was still operating at only one-half of its capacity and producing only semi-bleached pulp, owing to belated delivery of many critical pieces of equipment.

In Christmas week there were still 77 men employed on construction work at the new city of Marathon, Ont., site of the mill. Sufficient construction was expected to be completed by the holiday period for full bleaching and during January the new mill was to reach capacity output of 300 tons daily.

The ultra-modern mill actually had its first cook from the digesters Sept. 20 when the electric control button was pressed by Niles M. Anderson, vice president and manager. For Mr. Anderson it was an event of special significance, for the remarkable 300-ton mill at Marathon, a revolutionary project in many respects and one that, in at least certain respects, may establish a new pattern for pulp mill builders throughout the country, is very largely the creation of Mr. Anderson, who designed many of its unique features.

A PULP & PAPER INDUSTRY editor visited Marathon in recent months. He had been there a little more than a year previously, when construction of the mill had been barely started, although a considerable section of the attractive new townsite had been laid out. The return visit was an impressing experience, because some amazing things have been accomplished at Marathon during the past year.

Marathon today is something that the whole industry may be proud of; big things are expected of the mill and there is likelihood that in coming years it will be one of the pacesetters in production, with maximum economy, of bleached sulfate pulp.

Many of the old, standard ideas of design and operation have been utterly discarded at Marathon, and one of the exciting things about the whole plant is that every feature is new and up-to-the-minute.

Every department is refreshing in its bright and cheerful appearance. This factor, incidentally, wasn't left to chance; it was planned that way. A clever scheme of color dynamics, worked out by Pittsburgh Glass Co., conveys the basic idea of visual pleasure—the plant is wonderfully "easy on the eyes," and this is partly due to the fact that walls and equipment in the rooms that are ordinarily warm are colored with cool tones, the cool rooms with warm. Coloring effect is also applied to equipment so that danger points and control mechanism are strikingly marked.

The men at Marathon have an extremely comfortable atmosphere in which to work, for no mill has more complete air conditioning and heating facilities in every department. Heating and air washing units were designed by Ross Engineering Co. of Canada, Ltd.

All Under One Roof

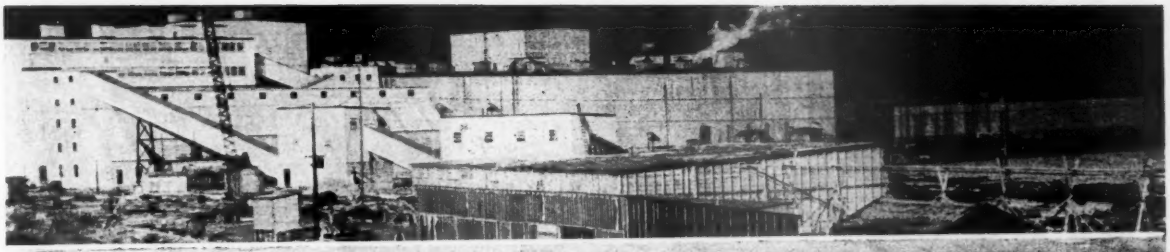
Bold throughout in conception and execution, the Marathon mill's

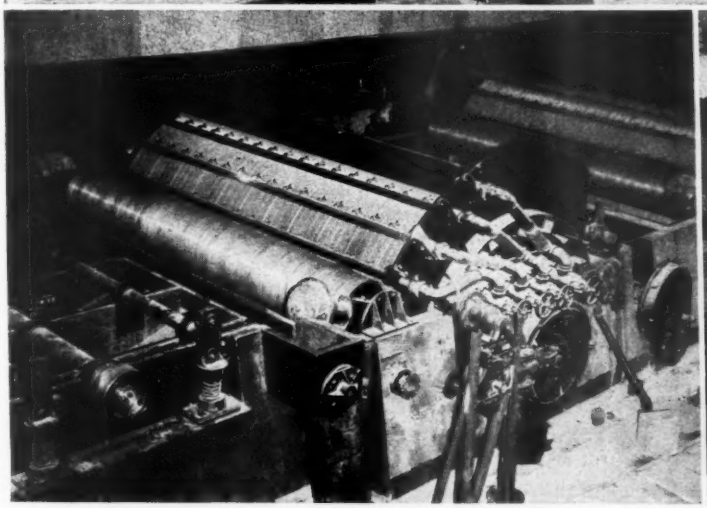
OUR COVER PICTURE

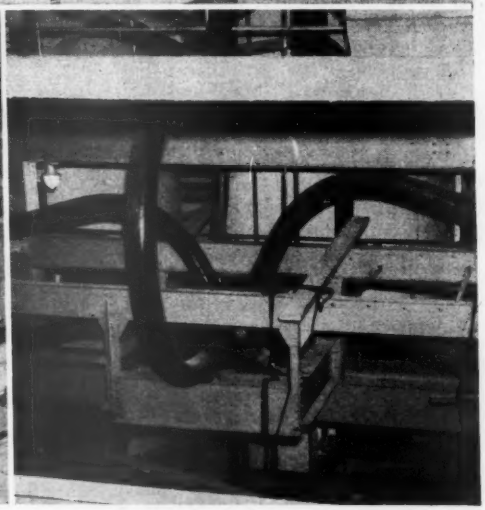
● ***shows a huge supply of pulpwood boomed in the mouth of the Pic River for the new Marathon mill now operating at Marathon, Ont.***

This scene is on the northern shore of Lake Superior.

A description of the new modern type of sulfate pulp operation and the kind of equipment selected for it begins on this page.







IN OUR NOVEMBER ISSUE (Page 50) we published two new pictures of the new Marathon Paper Mills of Canada showing operating buildings, employes' living quarters, etc. Here are more pictures taken made exclusively for PULP & PAPER INDUSTRY by its own representative who made the trip to Marathon to write up this new mill.

Top view—Principal buildings. Wood handling at left. Chipper and conveyor to top of chip storage building. Digesters and bleach plant in left section of main building. Right end houses recovery boilers, main mill and machine rooms. Pulp storage at right.

Middle view—Two block piles with Pic River pulpwood filling most of bay. Example of living quarters in foreground.

Lower left—Impco pre-knotter and section of four-stage washing system at Marathon which is one of most interesting new installations.

Lower right—One of the unique installations —a seven-port Spangenberg blow valve which connects with all digesters.

most conspicuous novelty is probably the fact that practically every phase of production apart from wood handling is housed under a single roof. Even the main office, a spacious 60′ x 100′ rooom with Celotex sound-deadening ceiling, is located in the mill building. This single-building plan is one of tremendous importance in a place like Marathon, where the temperature sometimes dips below zero and the snow stays on the ground a long time. Men moving from one department to another can spend the whole working day indoors.

The co-ordination of every process and production division is also outstanding at Marathon, and this is expected to pay off bountifully as the mill swings into fully bleached production more recently. Automatic controls are operative throughout the mill, and while their installation was not an insignificant item in the cost, they will enable the mill to be run with a personnel of about 200 men, including management, maintenance, wood handling and accounting staff. Considering the productive capacity of the mill, this is remarkable.

The whole impression gained from a visit to Marathon is that the company knew very clearly what it wanted and was ready to pay the price in order to get just that. Marathon demanded the best and got it and, considering all the construction bottlenecks that had to be cleared, the end result—a first class mill in every particular that will probably set records in economy of operation—was attained with a minimum of delay. Some of the advantages that will be enjoyed at Marathon are cheap fuel, cheap power, an abundance of wood and efficient plant.

In the chip handling setup, Marathon has departed from the usual by eliminating the use of chip screens. The chipper is driven by a 500-horsepower unit direct connected. The chip bins, each with five outlets, and of saw-tooth design, are another interesting feature. And so are the four stage completely inclosed brown stock washing system with pre-knotter set ahead of the washers of Impco design, and the provision for burning knots in recovery furnaces for the recovery of their full value of chemical contents and fuel.

Tile rifflers and head boxes of Semtile construction supplied by Canadian Stebbins, is another installation that helps make Marathon different from the run-of-mill operations. Canadian Stebbins Mfg. Co. (Drummond Bldg., Montreal) also supplied high density towers and liners for stock chests.

Noiseless all-metal screens developed by Ray Smythe, Park Bldg., Portland, Ore., remove coarse fibers.

Pulp makers will admire the simple control of the screen room by one man who, through the effectiveness of automatic devices, is able to handle the riffling and screening of bleached and unbleached stock. The electric unit drives for a new pulp machine and pulp dryers represent the first such installation on these machines anywhere.

Among other Stebbins installations were linings for low density towers—seven of them—and three high density towers, nine washer vats, and seal boxes of Semtile construction, linings for concrete white water storage chest, concrete bleach liquor storage chest, bleach liquor-making chest and unscreened bleach stock chest, bleach screened stock chest, etc.

A secondary recovery system, worked out by Marathon and Babcock & Wilcox, which retrieves all chemicals in flue gases leaving furnaces and thus accomplishes an important economy in chemicals and heat, with B & W controls, is another unique device. This operates on the chemical absorption principle instead of electricity, the more usual method.

Black liquor from storage is passed over a tower of coke and air and is blown up through the tower to change the sulphur gas compounds to sulfates before evaporation. This reduces loss of hydrogen sulfide in the evaporators and loss of sulphur as gas in the recovery of flue gases.

The bleach plant is one of the most modern designed for the efficient bleaching of sulfate pulp. Every consideration was given for the protection of the cellulose fiber and it is claimed that the bleached pulp will be equal or greater in strength than the unbleached pulp.

Marathon power is just about the cheapest that can be produced in that over 50% of the steam generated is from recovery furnaces. The actual cost of power is merely the mechanical loss through the turbine. Roughly, the cost at Marathon is less than $12 per h.p.

Marathon has not overlooked the fact that there are three essential ingredients in every manufacturing company's successful operation—organization, mill and townsite.

The mill and the organization speak for themselves, but the townsite has been as carefully planned and developed as the other two factors. The result has been creation out of the wilderness of a model community, with hotel, stores, bank, recreation centers, theaters, as well as apartment houses, duplexes and other dwellings, including a group of prefabricated cottages that would be a tasteful addition to any metropolitan residential section. The scheme of landscaping will make Marathon one of the most desirable communities in the industry.

Personnel

John Stevens, Jr., of Wausau, Wis., executive vice president, was recently appointed president of Marathon Paper Mills of Canada, succeeding D. Clark Everest, who advanced to the chairmanship of the board. Directly in charge of the planning and execution of plans for the company's mill and townsite in Canada since their inception has been Niles M. Anderson.

Much credit is due Grant D. Ross, chief engineer and assistant to Mr. Anderson, who successfully headed up the engineering of the big project under the most trying times when it was impossible to obtain engineers with pulp mill experience. Mr. Ross was formerly with V. D. Simons, a Chicago pulp and paper engineering firm, and has been connected with this type of engineering for the past 18 years.

Marathon is fortunate in having a

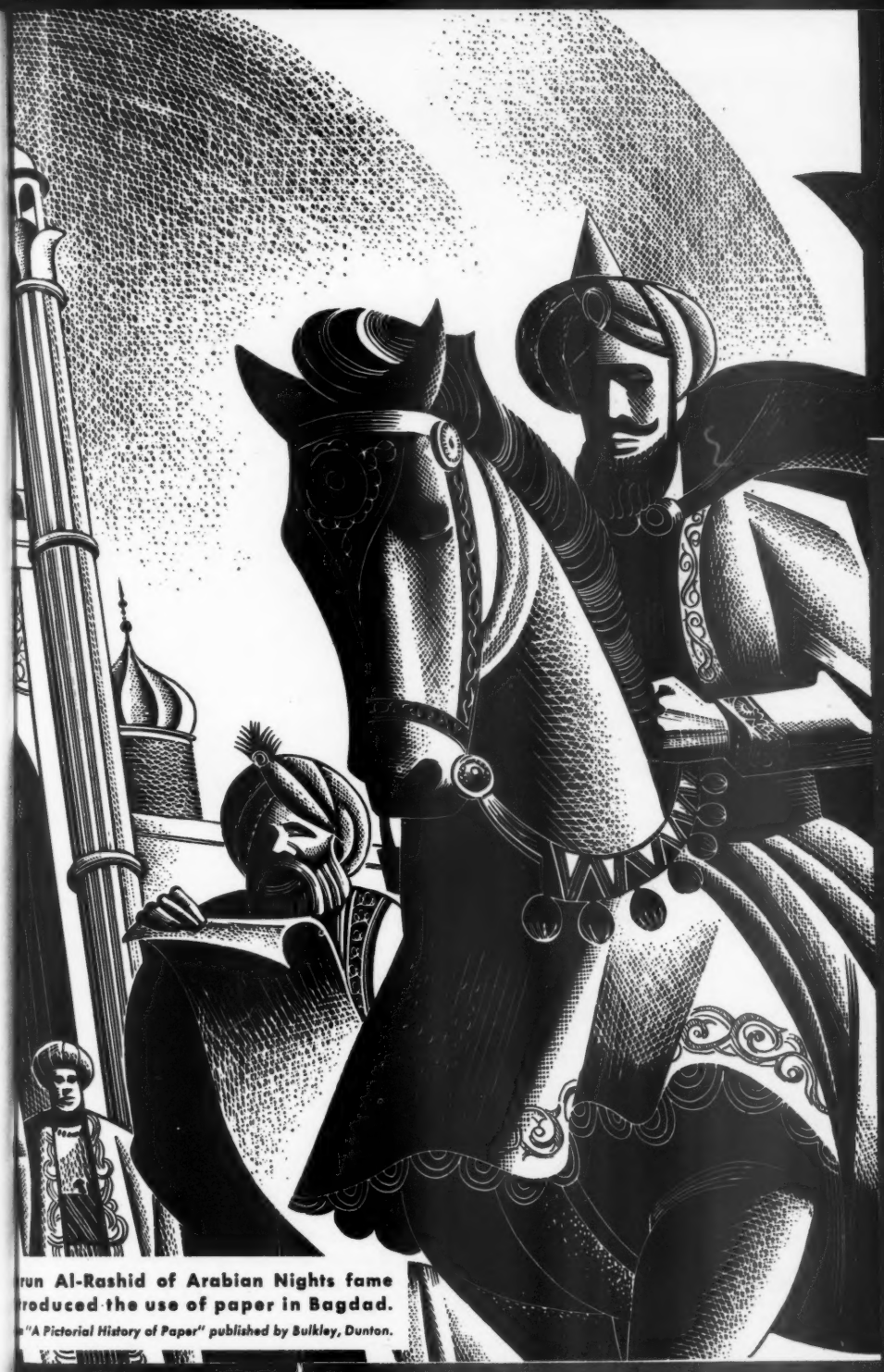
NEW TISSUE MACHINE FOR MENOMINEE, MICH., MILL

Besides the new pulp mill in Ontario, described in this article, major postwar expansion projects of Marathon Corp, are:

1. A new 136-inch Yankee Fourdriner tissue machine for the Menominee, Mich., Division (formerly Hoskin Paper Co.). Beloit Iron Works expects to deliver this machine in the spring of 1947. With one 164-inch Fourdriner now operating, this mill has capacity of 70 tons per day, and makes kraft and sulfite papers, including sack, gummed, twisting, waxed and oil-treated.

2. New carton plant at Menasha, Wis., mill, now under construction. This will produce paraffin cartons for butter, ice cream and similar products. This mill has listed capacity now of 25 tons daily for sulfite papers all converted in its waxing plant.

Other Marathon operations are the parent Rothschild, Wis., mill making normally 175 tons of paper and board and 110 tons of bleached sulfite pulp, as well as plastic and chemical by-products; and the 25-ton toilet and tissue mill at Ashland, Wis.



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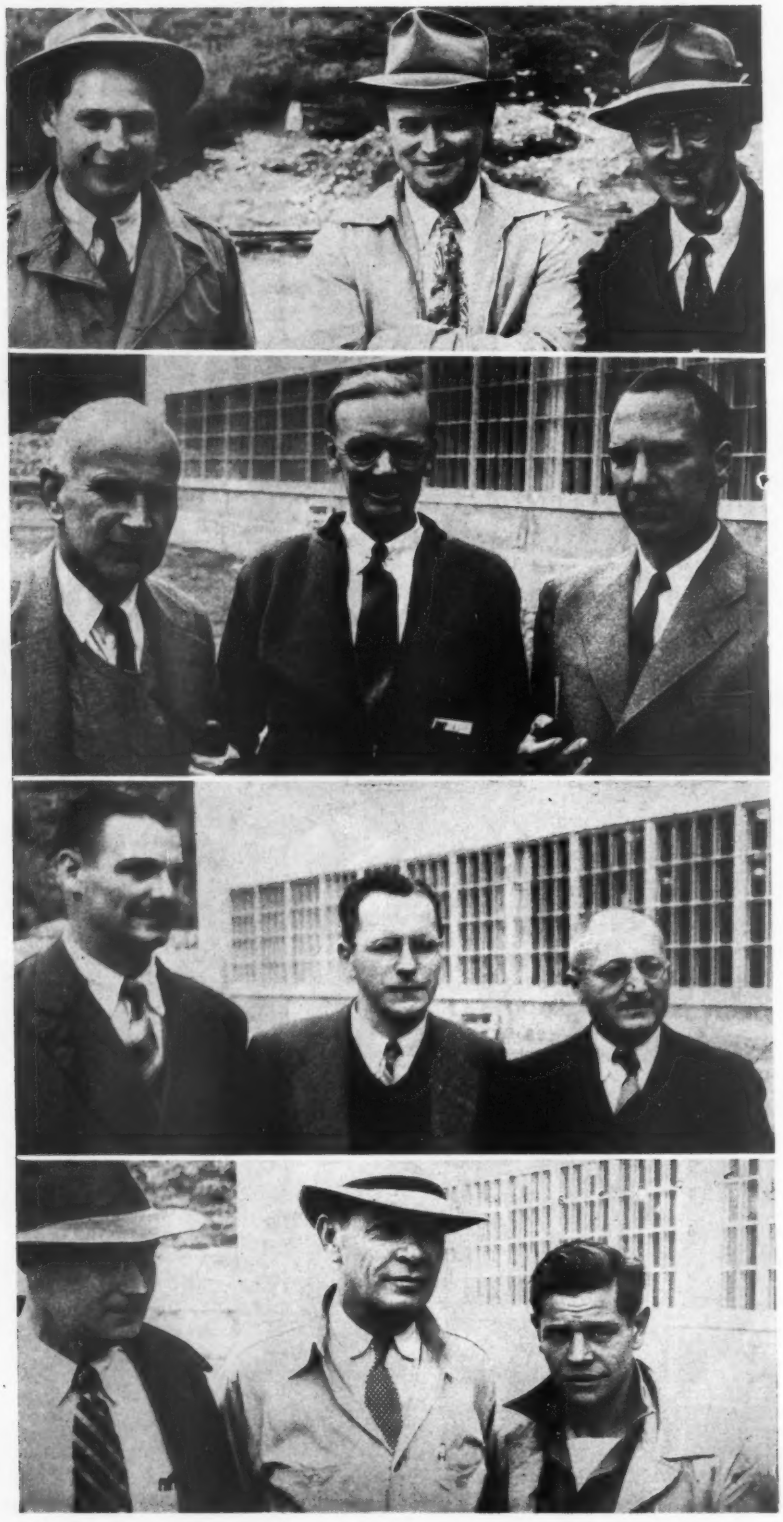


MORE PICTURES of Marathon Paper Mills of Canada personnel:
Top row (left to right): HUGO TRYGG, Asst. Supt.; GRANT ROSS, Chief Engineer and Assistant to Vice President Anderson; and PHIL MORGAN, Power Plant Supt.
Second row (l. to r.): C. A. WILLIAMS, Purchasing Agent; A. R. KNIGHT, Personnel Mgr.; and A. R. MacCALLUM, Controller.
Third row: W. R. RODRIQUE, Traffic Supt.; IAN BIRCH, Senior Chemist, and DR. FERDINAND KRAFT, Technical Director.
Last row: CHARLES MUNT, Master Mechanic; JAMES BOUNDS, Asst Supt., and CLAUDE Steeves, Night Supt.

fine array of experience and talent represented in its staff. James Ruck, operating superintendent, who joined Marathon in February, 1946, has had over twenty years' experience in actual operation of kraft pulp mills in the east and west and is ably applying all this knowledge to the successful operation of the big new mill.

Hugo Trygg, assistant superintendent, who joined Marathon in May, 1946, has had similar experience. Claude Steeves, night superintendent, joined Marathon in June, 1946, and came to the company with many years of experience.

Assisting Mr. Ruck are also James Bounds, formerly with International Paper Co., Fred Philes and William Feeney, both formerly connected, as was Ruck, with the St. Regis Paper Co. at Tacoma, Wash.

A. R. MacCallum, controller of the company, is a graduate of the University of Toronto and worked for the Canadian government in Ottawa during the war after several years with Clarkson Gordon & Co., accounting firm.

C. S. Williams, purchasing agent, is well known in eastern Canada and before joining Marathon was in charge of purchasing for a government war plant.

W. R. Rodrique, traffic superintendent, previously held a similar position with Canadian International Paper Co. at Temiskaming.

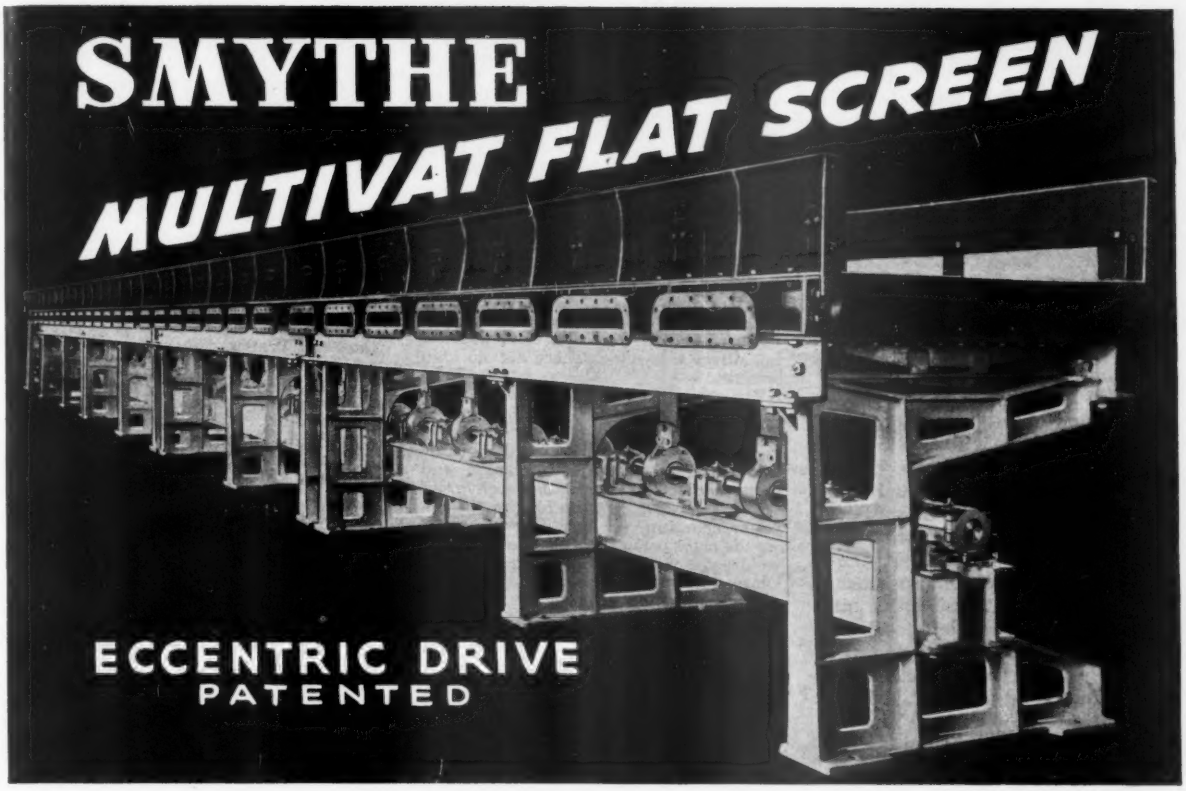
Leonard Pennal, townsite administrator, joined the company with several years' experience in management of wartime housing for the Canadian government.

Ferdinand Kraft, technical director, who joined Marathon in August, 1945, has had over 20 years' experience in the industry, most of which was spent with Canadian International Paper Co. at Hawkesbury and Temagami. Dr. Kraft has done considerable technical work in bleaching throughout the world, including Sweden and the United States.

A. R. Knight, personnel manager, was assistant director of the Unemployment Insurance Commission in Toronto before joining Marathon and has had many years of experience in industrial and labor relations.

Charles Munt, master mechanic, is well acquainted with the equipment and operation of sulfate pulp mills, and he likewise came from Tacoma.

Orville McKenzie is wood yard foreman. Harry Stafford, chief electrical engineer, has had many years



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KOPPERS COMPANY	PISTON RINGS

of operation and design of modern plants in Canada. His previous position was with Aluminum Corp. of Canada.

Ken Anderson, who has been chief draftsman, will continue as assistant to Mr. Ross. Ian Birch is senior chemist.

Philip Morgan is power plant superintendent and was formerly in charge of the large power plant of the Polymer Corp. at Sarnia, Ont.

Roy Emery, who was assistant chief engineer during the construction stages, recently resigned to become chief engineer for the Red Rock division of Brompton Pulp & Paper Co.

Foundation Co. of Ontario, Ltd., is finishing the construction of the big mill as fast as materials are delivered. Their staff still includes Frank Mullins, superintendent; Harry Serson, assistant superintendent, and Tiny Adams, engineer. R. E. McGrew of Stone & Webster Engineering Corp., left Marathon Sept. 1, but T. T. Jones has been left to finish up the odds and ends for the firm.

Vice president in charge of the woods department is H. P. Klinestiver, whose headquarters are at Port Arthur. His staff includes P. D. LeMay, assistant manager.

The company has extensive pulpwood holdings north of Lake Superior in the Pic River section, and the wood is floated down the river from a series of camps in the headwaters country. When it reaches the lake it is towed in bag booms by one of several towboats operated by the company and held in the booming grounds at Marathon west of the mill.

Spruce is the main wood used for pulp with a small percentage of jack pine. The hardwood that is used will be processed separately; in fact, the chip storage bins are designed to keep separate as many as five different wood species.

Equipment Which Makes This a Model Mill

The company's haul-up and wood handling facilities were designed by John Stadler of Montreal and they were laid out to take care of 90 cords of wood per hour. The jackladder takes wood in four, eight and 16-foot lengths. It is equipped with an eight-inch chain haul, the 16-foot logs riding the entire distance to a three-saw slasher mill, driven by a 30 h.p. motor per saw and equipped with a 60-inch circular saw.

There are several types of conveyor in the wood handling rig. A Link-Belt chain conveyor operates from the slasher to the cross conveyor supplying the drums, which is a 60-inch flat belt. The discharge conveyor from the drums to the block piles or mill is also of the belt type. All wood conveyors are equipped with Peacock worm speed reducers.

The slasher mill cuts all incoming logs to four-foot lengths. The three barking drums, 15x45, were manufactured by Horton Steel Co.

There are to be five block piles eventually, although only three are at present in use. Yearly consumption of the mill runs to about 170,000 cords. Pulpwood is fed direct to the mill during summer period, from May to October, the block piles being in service only during the winter.

The four-foot logs are conveyed a distance of approximately half a mile to the Horton washing drums, of similar size to the barkers. and here the remaining bark, ice and snow are removed before the pulpwood passes along to a 10-knife 110-inch chipper, manufactured by Waterous, Ltd., at Brantford, Ont., with 500 hp. direct connected. There are no chip screens.

The conveying system carries the chips to five chip-storage bins, each bin served by five outlets. Rubber belt for the conveyor system has been provided by three companies — Goodyear, Dominion and Gutta Percha. Five parallel conveyors bring the chips from the bins to the digester charging conveyor, and in so doing the chips pass over a Fairbanks-Morse weightometer which is integrating and allows for automatic registration of the wood tonnage.

There are seven digesters, each of 3,260 cubic feet capacity and equipped with Esco circulation and indirect heating with automatic controls which register liquor feed, charging and cooking. Westinghouse electrical equipment is used throughout the mill.

An interesting piece of equipment is the seven-port Spangenberg blow valve which connects with all seven digesters and whose operation provides for a single line entering the blow tank. Usually such valves connect with only four digesters. Each digester is equipped with its own electrically operated valve.

The pulp from the blow tank is pumped to two consistency regulators in conjunction with two Sherbrooke stock meters, each in turn regulating and controlling the flow of stock to each of two lines of Sherbrooke (Impco) vacuum filters. The brown stock (black liquor removal) washing system is engineered and manufactured by Sherbrooke Machineries, Ltd., in cooperation with their associates, Improved Paper Machinery Corp. of Nashua, N. H. This consists of two stock volume and consistency regulators from which the pulp flows by gravity to two Impco pre-knotters—the completely enclosed four-stage washing system being the first of its kind in the industry. The pre-knotters remove coarser knots and foreign material prior to washing. These pre-knotters are so designed that the discharge constitutes the feed inlet to the primary stage washer. The brown stock washing (black liquor removal) is accomplished on two sets or lines of washers, each line consisting of four 8 by 12 ft. Sherbrooke vacuum washers arranged for counter-current flow and equipped with automatic control throughout. These machines are of special steel and stainless steel construction and of improved "floor mounted" design. Greater efficiency in chemical recovery is the result of this process.

Semco tile rifflers for the unbleached pulp eliminate heavy dirt. They are followed by Smythe noiseless all-metal screens which remove coarse fibers and small slivers that may have escaped the pre-knotter. Incidentally, the knots removed by pre-knotter are crushed and burned so as to recover even the last pound of sodium salts and fuel value of knots.

Stock chests of ample capacity are located at various sections of the mill building so that temporary shutdown in any one section does not interfere with the steady flow of stock. The position of the stock volume is recorded simultaneously in the washer room, bleachery, screen room and dry machine room.

In planning the bleach plant, full advantage was taken of the best known practices in kraft bleaching. The process consists of a seven-stage continuous bleaching system, the mechanical equipment of which was designed and manufactured by Sherbrooke Machineries, Ltd., to the special requirements of the Marathon organization. The system is laid out for the maximum flexibility to meet variations in pulp manufacturing requirements and all equipment is automatically controlled.

After the bleach plant, the stock is riffled again to bring out any mineral dirts and it is screened—again by the noiseless method with finer screen, and the stock then passes to two modern 36-inch wet machines and pulp dryers. The drying machines are served by Matthews conveyors and with cutters and automatic layboys.

The shipping shed is 204 ft. by 440 ft. and has accommodation for 26,000 tons—one of the biggest in the industry. The shed will also serve as a storage for salvaged equipment, piping and packaged chemicals.

Nearly every pound of sodium and sulphur is recovered, and in order to achieve this a new process has been developed and installed for the first time, at Marathon. Secondary recovery is effected on chemical principles and this also gives complete heat recovery.

The black liquor is evaporated in a special six-effect seven-body vacuum evaporating system built by Goslin-Birmingham through John Inglis, Ltd., Toronto. With this equipment 300,000 lbs. can be evaporated in an hour. This concentrated liquor passes through scrubbers and is finally burned in two Babcock & Wilcox-Tomlinson recovery boilers.

The smelt-liquid ash—from the recovery boilers is dissolved in weak liquor, causticized, clarified and finally reconverted into white liquor in a Dorr continuous causticisizing system.

Steam is provided in addition to that from the recovery boilers by two Combustion Engineering Co. boilers equipped to use fuel oil or pulverized coal. The designed pressure is 675 pounds, and the company is thus able to produce all its power economically.

Lake Superior water has a high rating in purity, but Marathon has provided for greater purification by five-stage boiler feed water treatments consisting of softening by Zeolite, acid and alkaline treatments, including internal phosphate application — all stages being automatically controlled.

A 48-inch main line has its intake 1,900 feet out in the lake and at a depth of 40 feet.

Effluent from the mill is pumped over the Peninsula to the east and discharges into Lake Superior approximately two and a half miles from the water intake. The effluent from the mill will not contain solids and portions which will cause any nuisance. Practically the only chemical will be from the first stage of bleaching and will be chlorine residual and this will not pollute the waters of the lake.

Stebbins at Marathon

PLATE TILE LININGS INSTALLED IN

7 Concrete Low Density Towers
3 Concrete High Density Towers
1 Concrete White Water Storage Chest
1 Concrete Bleach Liquor Storage Chest
1 Concrete Bleach Liquor Making Chest
1 Concrete Bleached White Water Chest
3 Concrete Dump Chests

TOTAL 17 INSTALLATIONS

SEMTILE BLOCK CONSTRUCTION

2 Sets of Riffiers together with Head Boxes
9 Washer Vats
9 Seal Boxes
2 White Water Head Boxes
2 Suction Mould Head Boxes
1 Consistency Regulator Vat

TOTAL 25 INSTALLATIONS

MISCELLANEOUS PLATE TILE LINING & SEMTILE MIDFEATHERS INSTALLED IN

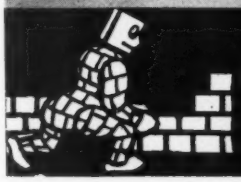
1 Concrete Unscreened Bleached Stock Chest
1 Concrete Bleached Screened Stock Chest
1 Concrete Screened Brown Stock Chest

Above are lists showing the type and number of linings and Semtile block constructed equipment installed by Canadian Stebbins Engineering & Manufacturing Co., Ltd. in the new Marathon mill.

They are representative of the scope and type of Stebbins service available to pulp and paper mills.

When you have a lining or tile tank problem, consult a Stebbins engineer. He can give you the benefit of the knowledge and experience accumulated by the Stebbins organization — who for sixty-two years have specialized in designing, installing and servicing linings and tile block construction in pulp and paper mills.

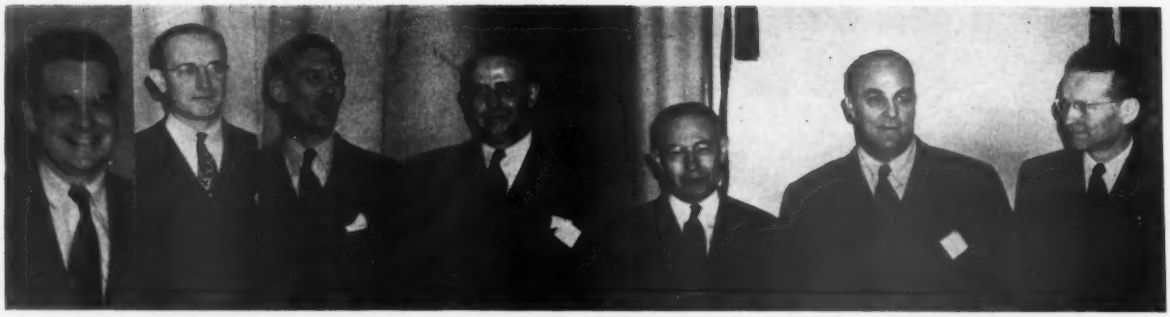
There is no obligation whatsoever attached to a consultation with a Stebbins engineer.



SEMCO

CANADIAN STEBBINS ENGINEERING & MFG. CO., LIMITED

DRUMMOND BUILDING MONTREAL, P. Q.



AT SUPERINTENDENTS MEETING IN SEATTLE (Left to right): Fred Armbruster, Dow Chemical Co., Secretary-Treasurer; Walter Holzer, Crown Zellerbach Corp., who gave paper on pulpwood species (see Dec. PULP & PAPER INDUSTRY); Bill Coster, Soundview Pulp Co., who chairmanned Pulping session; Charles Ackley, Crown Z., the retiring Chairman; Wash. State Supreme Court Justice Matthew W. Hill, luncheon speaker; Chet Mulledy, Rayonier, First Vice Chairman, and H. Rad Russell, Everett Pulp & Paper Co., elected Second Vice Chairman.

WEST COAST SUPERINTENDENTS

May 22-24 Dates for Chicago and Gearhart Meetings

The National Superintendents Convention, to be held in Chicago, and the Pacific Coast Superintendents-TAPPI Joint Spring Meeting, in Gearhart, Ore., will be held on the same dates—May 22 to 24.

This will be one of the rare times that dates for these meetings have conflicted. The new president of TAPPI, to be elected in late February, is expected at the meeting on the Oregon coast, however, and will lift that meeting to a place of importance closely rivaling even the Chicago gathering.

The new Pacific Coast Superintendents division chairman, Gerald F. Alcorn, superintendent of Weyerhaeuser's new sulfate pulp mill at Longview, Wash. (under construction), will attend the Chicago meeting. National President Homer Latimer (Champion's division manager at Hamilton, O.), has announced the Edgewater Beach Hotel in North Shore Chicago, has again been selected for that meeting site.

On the other hand, a considerable number of leading industry association executives and equipment or supply company representatives are expected to be at Gearhart, rather than at Chicago. Attendance at Chicago probably will run around 1,000 and at Gearhart around 350—both being among the largest industry meetings of the entire year. Combined, they will just about equal attendance expected next month at New York's "Paper Week."

Worthen E. Brawn, general superintendent, Pejepscot Paper Co., Brunswick, Me., is slated to succeed Gunnar W. E. Nicholson, Union Bag & Paper Corp. vice president, as TAPPI president, and he would be honor guest at Gearhart.

Dates and plans for both the Oregon coast and Chicago meeting were discussed at the Superintendents' recent Pacific Coast convention in Seattle.

As evidence of the growth and increasing importance of the Pacific Coast industry, the final registration count for the 13th annual convention of Pacific Coast Superintendents, held in Seattle in late November, showed a record-breaking figure of 273—176 men and 97 women.

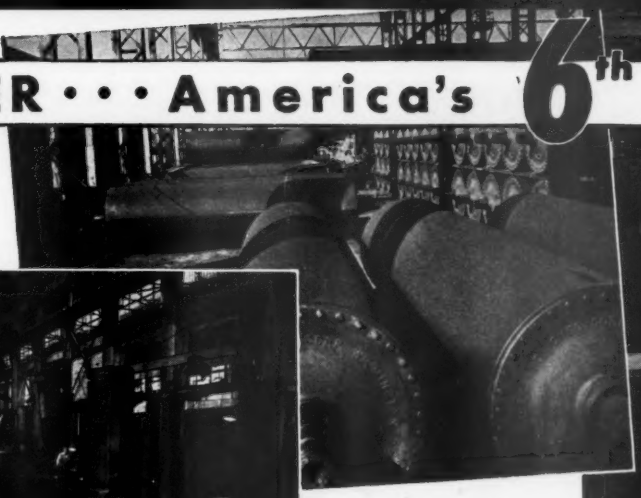
And if further proof of this 13-year growth were needed, it was revealed in the announcement at the business session by Fred Armbruster of Dow Chemical Co., the secretary-treasurer, that this second largest division in the association now has 110 paid-up members and four honorary life members.

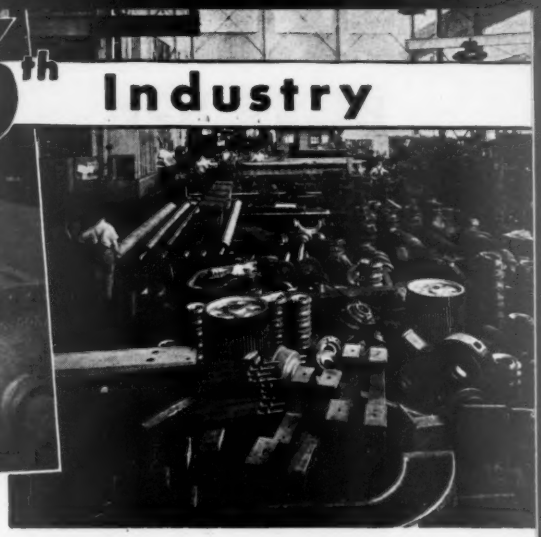
A motion was carried at the business meeting putting the division on record as approving a national convention on the Pacific Coast in 1951,

(Continued on page 61)

GERALD ALCORN (left), new Chairman of Coast Supts. and likewise new Superintendent of the sulfate mill-to-be of Weyerhaeuser Timber Co. Next on his left are a trio of Paper Mill Superintendents and an Electrical Engineer who made things hum at paper and board sessions (left to right): Charles Meagher, Fibreboard Products Inc., Port Angeles; Anton P. Siebers, Longview Fibre Co., Longview, Wash.; C. D. Riese, General Electric Co., and Harold Quigley, Crown Zellerbach Corp., Port Townsend, Wash. Others who gave papers in this session but were not present for picture were R. T. Petrie of Black-Clawson Co., and W. K. Ball of a Seattle rubber firm.

PAPER · · · America's 6th Industry





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Each new Puseyjones Machine incorporates the lessons learned in four years of war-time research and development—improvements that mean bigger tonnages for you.

Among the new machines under construction by Puseyjones are three of the largest and fastest Fourdrinier Machines, one for book and high grade printing, one for white paper for bags, and one for Kraft liner board; also one Cylinder machine of record size and speed for the manufacture of floor covering felt. Other machines are under construction for the manufacture of M. G. Kraft specialties, facial tissues and high grade bristols.

During the next eighteen months these machines will go into production in North Carolina, Massachusetts, Florida, Georgia, New Hampshire, New York, and California, as well as in Mexico.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

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HERE'S HOW MILL HOLDS "OPEN HOUSE"

It's not every day that a paper mill holds an "open house," its staff guiding many hundreds of visitors safely through its premises while at the same time carrying on production at full steam.

When such a thing happens, perhaps it is useful for other mills, which might envision benefits in a similar undertaking, to know how it was done.

The 300-ton-a-day kraft mill of Crown Zellerbach Corp. at Port Townsend, Wash., was a "showplace" throughout the day and evening of Dec. 6 for some 1,700 visitors. Visiting parties ranged from a general and other top officers of nearby Fort Worden and another group comprising most of the 28 local stockholders in the company, to a veritable parade of school children from all over the county.

Local officials and business men and labor unions—not the mill management—actually "carried the ball" and put on the show. Resident Manager E. W. Erickson said cooperation of the unions was "excellent."

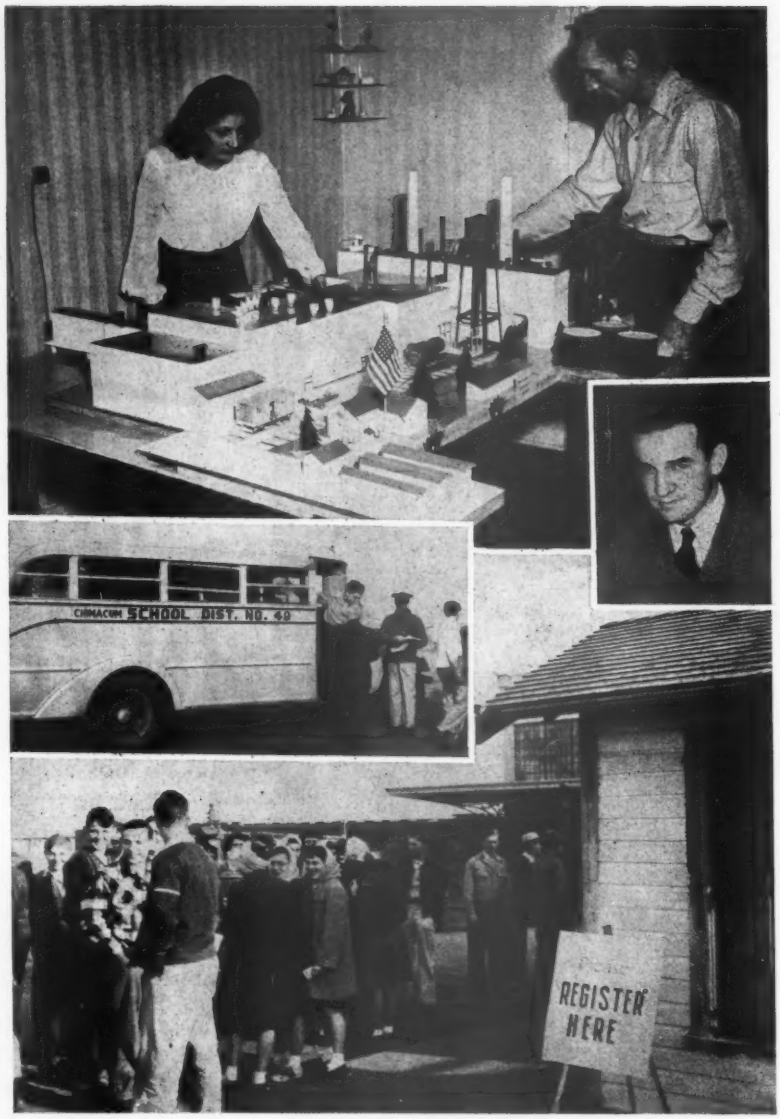
A preliminary build-up for the big day was provided by showing the F. C. Huyck & Sons Co. movie on papermaking, familiar to so many in this industry, in the schools. This helped to instruct children on what they were going to see in actuality.

Bernard Mullaney, personnel and safety supervisor and chairman of the joint management-labor "open house" committee, and Don Osborne, his assistant who returned to the mill just last summer from the army engineers, manned a megaphone at the mill gate to organize parties. Margaret Yarr, secretary in their department and sister of the former Notre Dame football star, registered all visitors.

Large yellow arrows were placed throughout the "line of travel" for visitors. Obstacles were placed in danger areas. Unions provided guides. At each important unit or machine was a sign describing the equipment and explaining what it accomplished.

Pays "Friendship" Dividends

The mill's lathe-type big log hydraulic barker; the spic and span power room, the B & W recovery boilers; the two paper machines and the high speed bag machines were high spots of the tour as well as a final display of mill products and a cardboard model of the entire mill layout. The No. 2, 256-in. Fourdrinier which runs grocery bags at up to 1150 ft. per min., was running 60-lb. Bates valve stock at a little slower pace. Otherwise there might have been a little too much activity at the dry end with the crowds milling around, but there was enough going on to make it very interesting for the visitors.



SCALE MODEL (above) OF PORT TOWNSEND, Wash., kraft mill, done entirely in cardboard and appropriately colored, was one of the attractions at that mill's open house. In picture are Mr. and Mrs. John Messar (he is lime kiln operator at the mill) who spent six months building this model, complete with tiny rr. cars, water towers and even roof vents.

Views below show some of 525 school children from entire county who went through mill, arriving on school buses at the mill gate for conducted tours. A total of 1,700 persons went through the mill while it continued in full operation.

Perhaps hardest working man on Resident Manager E. W. Erickson's staff, in seeing that all trips went off smoothly, was BERNARD MULLANEY (see inset photo), Personnel and Safety Supervisor of this mill.

An attractive souvenir program was given to all visitors with an air view of the mill; a welcome message from Mr. Erickson; facts on mill production, payrolls, etc., and a reproduction of the front page of the Port Townsend newspaper of July 2, 1927, headlined "Paper Mill Assured . . . No Need to Raise Water Rates" and a secondary story, "What the Zellerbach Mill Means to Port Townsend."

Beverly C. Smth, technical assistant to Pulp Mill Superintendent Norman Lewthwaite, arranged signs and display. Copy was written by Mr. Smith and Paul Thiele of the accounting department, and Charles Stainsby of the engineering department made the signs.

Undoubtedly, Port Townsend's "open house" will pay dividends for years to come in the proud and understanding friends and supporters it won for the mill, including a new generation just growing up.

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WALLBOARD MANUFACTURE IN SWEDEN ACCORDING TO THE DEFIBRATOR SYSTEM

By Uno Lowgren

President, American Defibrator, Inc., Chrysler Bldg., 405 Lexington Ave., New York 17, N. Y.

This is first publication of a paper of interest to industries seeking closer utilization of wood resources which Mr. Lowgren presented at a meeting Dec. 11, of the new society, Associated Forest Products Technologists, at Longview, Wash.

The fiberboard or wallboard industry in Sweden is quite young, the first mill not starting operation until late in 1929. Since that time no less than 14 plants manufacturing insulating as well as hardboard have been established.

The first plant erected was the Swedish Masonite factory which manufactures hardboard, using the Masonite process developed in the United States by the late W. H. Mason. Of the 14 plants in existence today nine produce both insulating and hardboard; three hardboard only, and two insulating board only.

Present production of Swedish wallboard mills is about 235,000 metric tons per annum, or approximately 700 million sq. ft. Of this about 143,000 metric tons represent various types of hardboard and about 92,000 tons insulating and low-density boards. With the expansion now in progress in several of these mills, production in the next couple of years is expected to increase considerably.

Hardboard production in Sweden is much higher than the insulating board output, the ratio being about 60% as compared to about 40% of insulating board.

In relation to American standards the Swedish mills, individually speaking, have comparatively small capacity, but it is still a fact that all these mills have been operating quite successfully. It is therefore natural to ask the cause of the rapid growth of the Swedish industry, particularly hardboard manufacture, and the reasons for greater production of hardboard versus insulating board, a relation that is reversed in the United States, where production of insulating board is at least double that of hardboard.

Development of the Swedish wallboard industry has been accelerated by several factors. Wood is one of Sweden's most important raw materials. Hence wood utilization industries have always been on the alert to try out manufacture of new products and new methods not only for domestic use but for export as well in order to utilize wood supplies to the maximum and best advantage. Hardboard, as produced by the Masonite process, found ready acceptance in the market, and the demand for it increased quite rapidly. Insulating board, also produced by the Masonite factory as well as by two other wallboard mills established in 1930, likewise found a growing market in house construction and other fields.

Aside from the fact there was suitable raw material available and a general interest in manufacture of such wood fiber products that presented economic operation, two important factors favored establishment of new plants. One was development in 1931-1933 of a new pulping process—the so-called Asplund Defibrator process, that lent itself very well to the production of wood fibers for both hardboard and insulating board. A second factor was that no basic product patent was granted in Sweden for either hardboard or insulating board and, therefore, various plants could be established quite independently.

A third factor was that hardboard can be produced economically at a capacity of only about 10,000 tons per year and hence requires far less raw material than is necessary for economical manufacture of cellulose by the kraft or sulfite methods. The wood supply problem in such mill operation is, therefore, comparatively simple.

Another important consideration is that no selective wood is required for the Asplund process, as regular sawmill waste or mixtures of both deciduous and coniferous woods can be used.

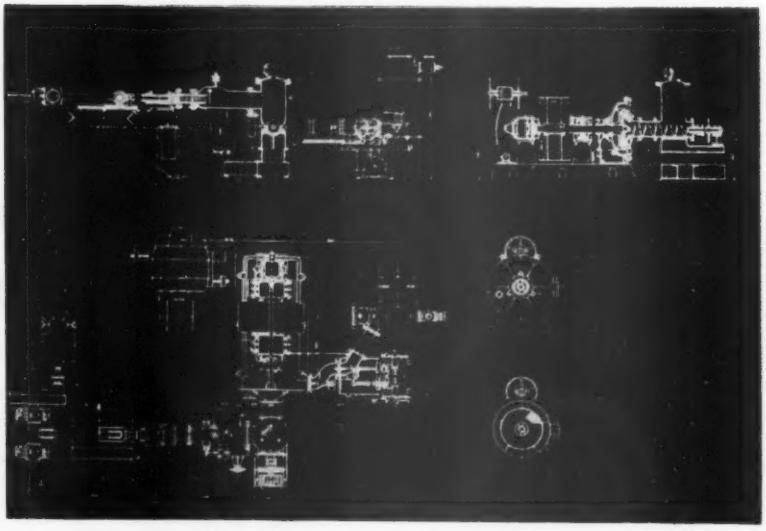
MR. LOWGREN, the author (upper left), with A. HALVAR LUNDBERG, prominent in development of the Pacific Northwest pulp and paper industry as a consulting chemical engineer. Mr. Lundberg is Pacific Coast representative of American Defibrator, Inc.

Defibrator Wallboard System

Of all hardboard produced in Sweden today about 75% is made entirely from Asplund pulp. Of 12 plants producing hardboard, nine use the Asplund process exclusively, and the hardboard manufacturing process used follows the design developed by A. B. Defibrator of Stockholm, which is generally known as the "Defibrator" system.

Of 11 insulating board producing plants, eight use Asplund pulp either entirely or mixed with other fibers such as groundwood.

Figures 1, 2 and 3 show flow diagram of hardboard and insulating board manufacture according to the Defibrator



AT RIGHT: FIGURE 4—Diagram showing operation of Defibrator. See description in accompanying article under heading "Defibrator Wallboard System."

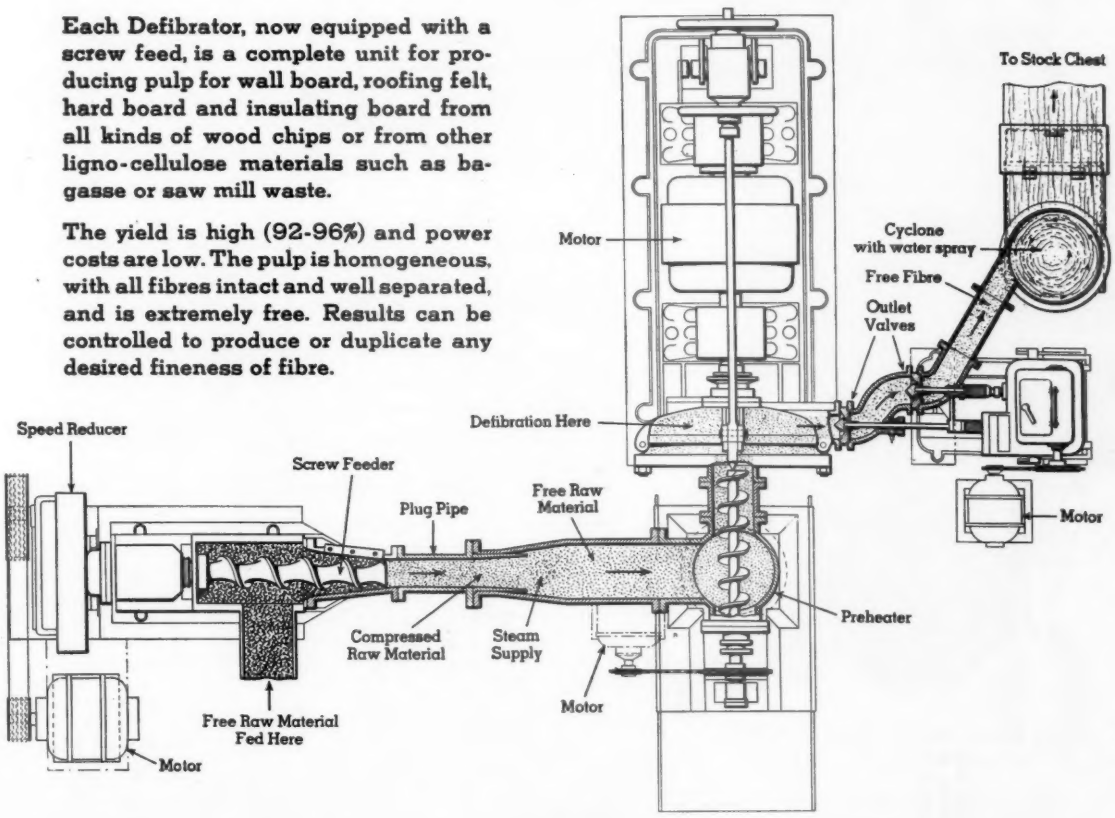
(First three figures pertaining to this article appear on page 44. The article continues on page 46.

for economical production of more uniform pulp . . .

The Asplund DEFIBRATOR

Each Defibrator, now equipped with a screw feed, is a complete unit for producing pulp for wall board, roofing felt, hard board and insulating board from all kinds of wood chips or from other ligno-cellulose materials such as bagasse or saw mill waste.

The yield is high (92-96%) and power costs are low. The pulp is homogeneous, with all fibres intact and well separated, and is extremely free. Results can be controlled to produce or duplicate any desired fineness of fibre.



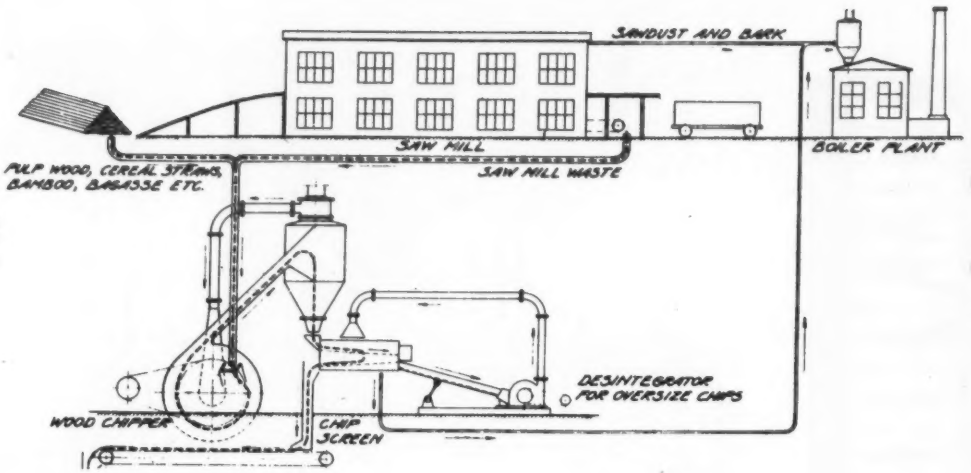
AMERICAN DEFIBRATOR, INC.

CHRYSLER BUILDING — NEW YORK 17, N. Y.

West Coast:

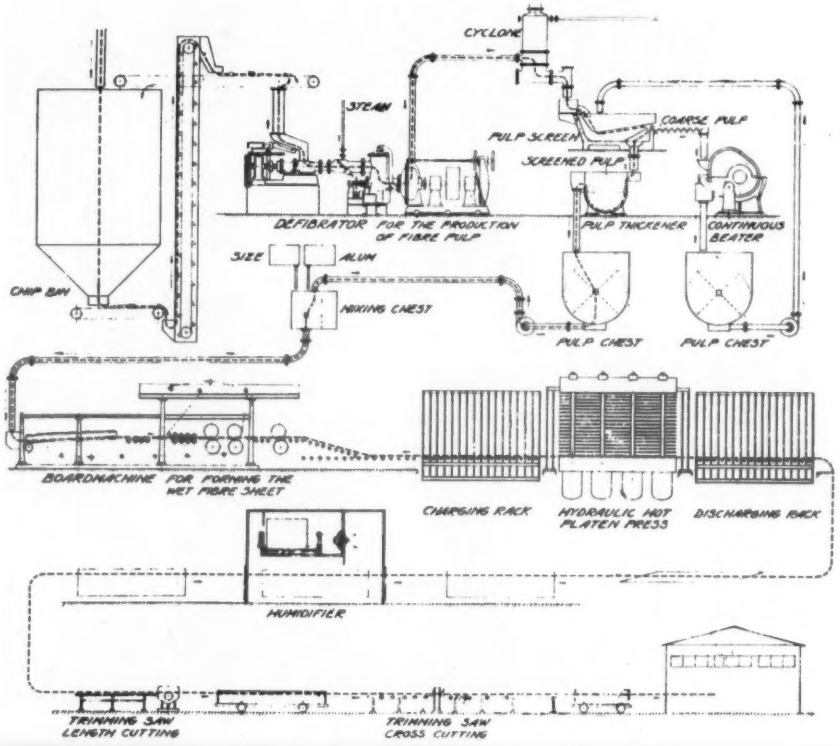
A. H. Lundberg — Textile Tower — Seattle, Wash.

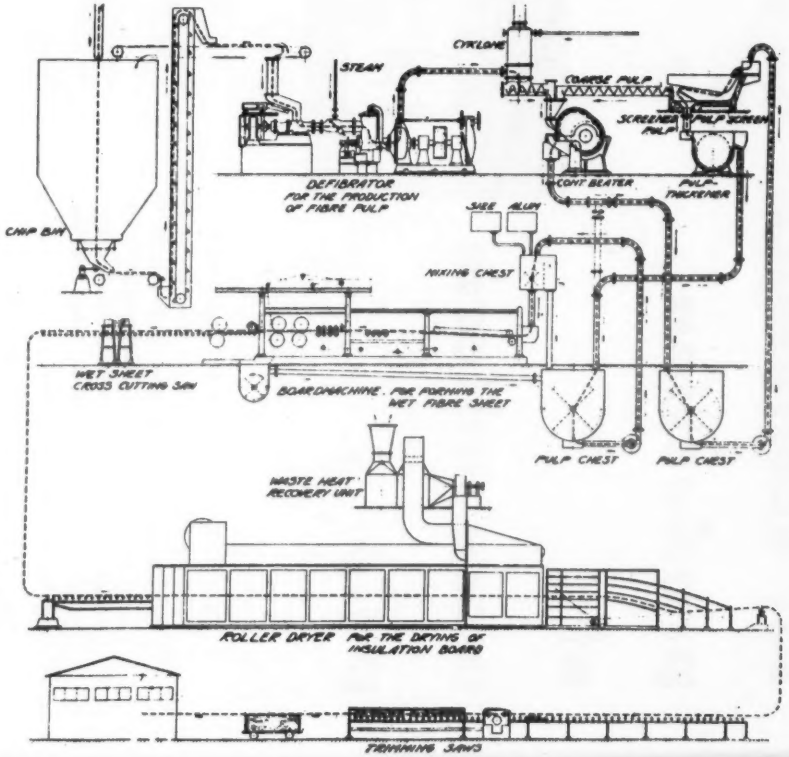
AT RIGHT—FIGURE 1:
Flow Sheet for both Hardboard and Insulating Board through Screening of Chips. Continuation of each process is shown below.



BELOW—FIGURE 2 (at left):
Continuation of Flow Sheet for Hard- and Semi-Hard Board.

FIGURE 3 (at right):
Continuation of Flow Sheet for Insulation Board.





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system. In both cases it is assumed the wood arrives in log form but it can also be supplied in chipped form, as is done in several cases where the board mill is working in conjunction with a saw mill.

Chipping of the logs and chip handling are the same in both cases, as is the pulping step as carried out in the Asplund Defibrators.

Pulping in the Defibrator is done at a steam pressure of from 150-160 lbs. per sq. in. The basic principle of the Asplund process is that the heating to temperatures of 150° C. and higher of wood or ligno-cellulose materials in general has the effect of melting or softening the so-called "middle lamella," which binds the individual fibers together. This melting or softening action starts immediately at temperatures above 100° C., but is most pronounced at 150° C. In this condition the fibers can easily be rubbed apart at low power expense.

The Asplund Defibrator operates as follows (See figure 4):

The chips are introduced into horizontal preheater by means of a reciprocating plunger or screw feed. Chips are compacted in the so-called plug pipes where they form a seal against steam. As chips arrive in the preheater the plug of chips breaks up. Heating of the wood chips in a steam atmosphere of 160 lbs. per sq. in. pressure takes only a short time—usually about one minute. From the preheater, chips are carried to defibrating discs where fiber separation takes place. Pulp thus made is discharged into the open air by means of a valve system, which consists of two valves operating between a discharge chamber. This chamber becomes filled as the first valve opens. Shortly after the first valve is closed the second valve is opened and the pulp and steam contained in this discharge chamber is blown out to a cyclone. Water is sprayed into this cyclone which condenses steam and forms a water suspension of pulp.

Power consumption for this process is about 180-200 Kwh/ton and steam requirement from 1,400 to 1,600 lbs. per ton of bone dry fiber, provided valves are kept in good condition.

Hardboard Manufacture

From the Defibrator the pulp in the hardboard process usually goes to a screen. Rejects are taken to a refiner, usually of continuous type equipped with Basalt-Lava stone, and back to the screen. Accepted stock goes to machine chests The pulp from the chest is pumped at a consistency of about 1.5% through a sizing box to the wet machine. The sizing for hardboard is carried out with an emulsion of either paraffine wax alone or in combination with rosin. The emulsion is precipated in the sizing box by regular alum. The amount of sizing is usually about 2 to 2½% of the bone dry fiber weight. The wet machine where wet fiber sheets are formed is of somewhat different design from the ordinary paper machine. For hardboard only a Fourdriner machine is suitable because unrefined Asplund pulp is quite free.

For the ordinary wet pressing system of making hardboard, stock used must be very free so water can be easily squeezed out from wetlap in the hot pressing operation without dislocating fibers as they are located in the wet sheet.

All hardboard wet machines are made 4 feet in width so as to give a finished product of 4 feet wide. The machine speed is quite slow, if compared to regular paper machines, the maximum speed seldom exceeds 40 ft. per min.

As most hardboards are produced in final thicknesses of ⅛ or 3/16 inches thickness of the wet sheet as it is formed on the machine is quite heavy. The wet sheet for ⅛ in. hardboard is about 1 in. in caliper, and for 3/16 hardboard about 1½ in.

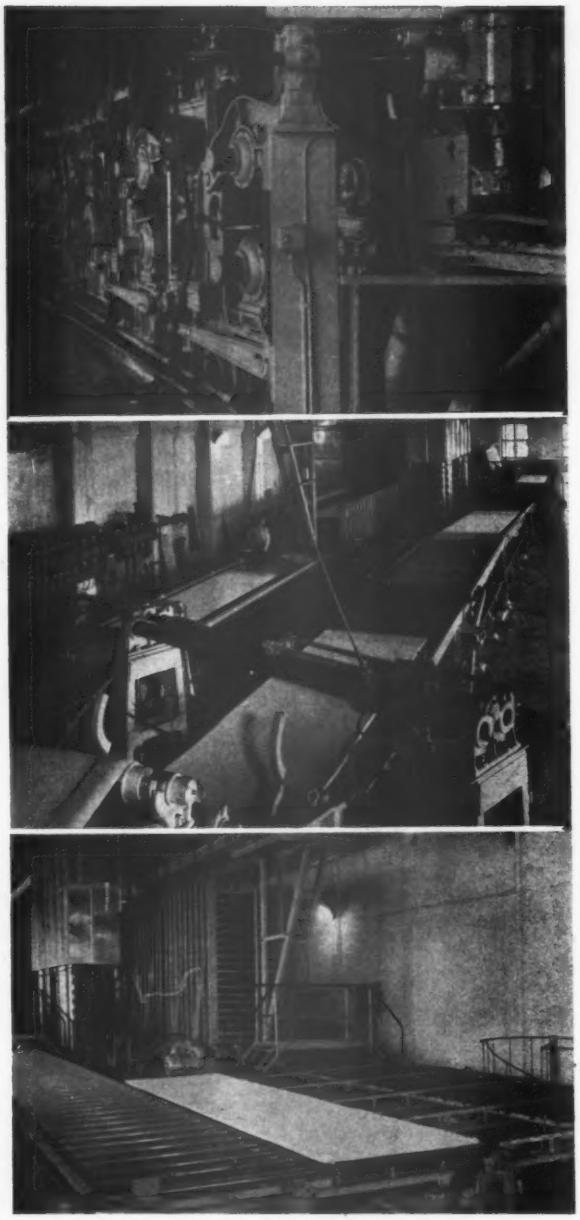
It is important to maintain a uniform flow of stock out from the headbox to get uniform thickness of wet sheet across its width. The headbox is therefore designed to give uniform overall distribution of stock. This is accomplished by leading the stock into the headbox in several pipes; also to make the headbox itself narrow to get high speed of flowing stock.

Due to large quantities of water to be removed, the wire section of the wet machine is inclined a few degrees, which also helps get uniform formation.

Another usable device for getting uniform distribution is a vibrating board that sticks down a fraction of an inch into stock and which is usually located a couple of feet from the headbox.

The number of press rolls varies considerably. Latest machines have adopted a few large cylinders instead of the previous practice of employing a number of smaller rolls. Latest development is to use felt presses—up to three are used. In this way water content in the wetlap has been reduced to as much as 60%, i.e., with a dry fiber content of 40%.

At the end of the wet machine, the wet lap is cut up into large sheets. As most presses in operation are of the 4 x 18 ft. type, the wet sheet is cut to a length of about 18 ft. 3 in. The cutting is made by means of a cross cutting machine, and the knife—a rotating circular affair—travels diagonally across the sheet. (See photographs.)



THESE THREE PICTURES SHOW, from top to bottom, major steps in hardboard manufacture after defibration and pulp preparation.

Top is Fourdrinier machine, required to make wet laps. Wet sheet for ⅛-in. hardboard is about one-inch caliper. Board is made 4 ft. wide. A few large press rolls, rather than several small ones, are preferable.

Note in second picture how wet lap is cut up into sheets by a rotating circular knife that travels diagonally across sheet.

Wet laps are loaded on transport plates automatically and carried to stationary loading rack on one side of press. On opposite side, a similar rack is provided for finished board. Loading and unloading takes place simultaneously.

Pressing

The system of handling transport of sheets from wet machine and loading them in multiples of 20 into the press has undergone a series of improvements until it now has reached a stage of complete mechanization.

The hardboard presses are all built with 20 openings so that 20 panels of 4 x 18 ft., can be pressed at one time. As the press is the heart of a hardboard plant and the cycle of the pressing operations really determines output of the plant, it is important that the time required to load and unload the

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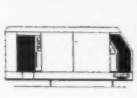
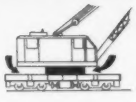


NO DANGEROUS SWINGING DOORS

ENCLOSED ROLLER-BEARING TURNTABLE



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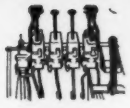

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press as well as the closing and opening periods for the press be as short as possible.

The Defibrator press loading system operates in such a way that wet laps are loaded on transport plates with a wire screen between the wet sheet and the plate. The wet laps are loaded on these plates automatically and carried to a stationary loading rack located on one side of the press. On the opposite side a similar rack is provided for the finished board. (See photograph.)

Loading and unloading of the press takes place simultaneously and, therefore, a minimum of time is consumed.

According to this system the wire screens which are needed to remove the water during the pressing oprations are placed on transport plates. Replacement of these screens is, therefore, very convenient, and wear of screen is far less than where the screen is used as transport medium in the press and stretched and operated between two rolls.

Hardboard made according to the wet pressing system has one side smooth and the other side marked by the wire screen. The smooth surface is obtained by highly polished stainless steel plates. The plates are held in place in the press and are arranged so that they can be easily removed for cleaning.

Pressing of hardboard is carried out at high mechanical pressure and at the same time at elevated temperature. Pressure is varied during the pressing and goes as high as 400-700 lbs. pr sq. in. actual pressure. This high pressure is usually applied in the early stage, and a lower pressure of about 150-180 lbs. per sq. in. is used during the latter part of the pressing.

Temperature in the press is around 190-200° C., corresponding to a gauge pressure for steam up to 230 lbs. per sq. in. Usually steam is employed but recent tests with hot water have been successful and certain economies in heat consumption have been realized.

Actual pressing time for regular ⅛ in. hardboard is only about 10 minutes, sometimes even less. The time to open and close the press as well as the loading and unloading operations requires about 5 to 6 minutes in all. The press cycle is therefore about 15 to 16 minutes.

In order to close the press in as short time as possible, the use of a water accumulator has been found very advantageous. These accumulators consist of closed tanks and contain an air cushion at the top. Water is pumped to a certain level in this tank and the air is compressed so that its pressure corresponds to what is required when the press is ready to be closed. The water and air volumes in the accumulator are calculated so that the water required for one press operation can be taken out without any greater drop in pressure. As soon as the water level falls below a certain point the pump connected to this accumulator will start and will continue until the top mark is reached, where the pump is shut off. As air is dissolved quite considerably at higher pressures, new air must be provided for at intervals. This is done by means of an air compressor connected to the top of the accumulator. By the use of an accumulator of this design a much smaller pump can be employed than if the pump were to work direct on the press plungers.

As a rule two systems of pumps and accumulators are used—one for the low pressure, i.e., up to about 350 lbs. per sq.in water pressure, which is used to close the press, and the other for the high pressure which goes up to 3,500 lbs. per sq.in. water pressure.

The steam to the press plates is provided by means of pipes, and in order to follow the plates when they go up and down these steam pipes as well as the pipes for the condensate are equipped with knee joints. The steam is not shut off between the pressings.. As a matter of fact, if the press is allowed to cool between the pressing operations there is a tendency for the board to stick to the surface plates. The steam consumption is usually about 2.5-3.0 pounds of finished board.

The operation of the press with the Defibrator loading system is very simple. It requires, as a rule, only one operator who handles the press pumps as well as the loading and unloading of the press from a central control table where he can start and stop all motors involved by remote control. In addition to this press operator there is usually one helper who also checks the condition of wires and transport plates.

Humidifying, Heat Treatment

The hardboard, as it comes from the press, is not ready for use. Because practically all moisture has been completely evaporated and removed, the dry board will pick up moisture from the atmosphere. This moisture absorption is accompanied by an

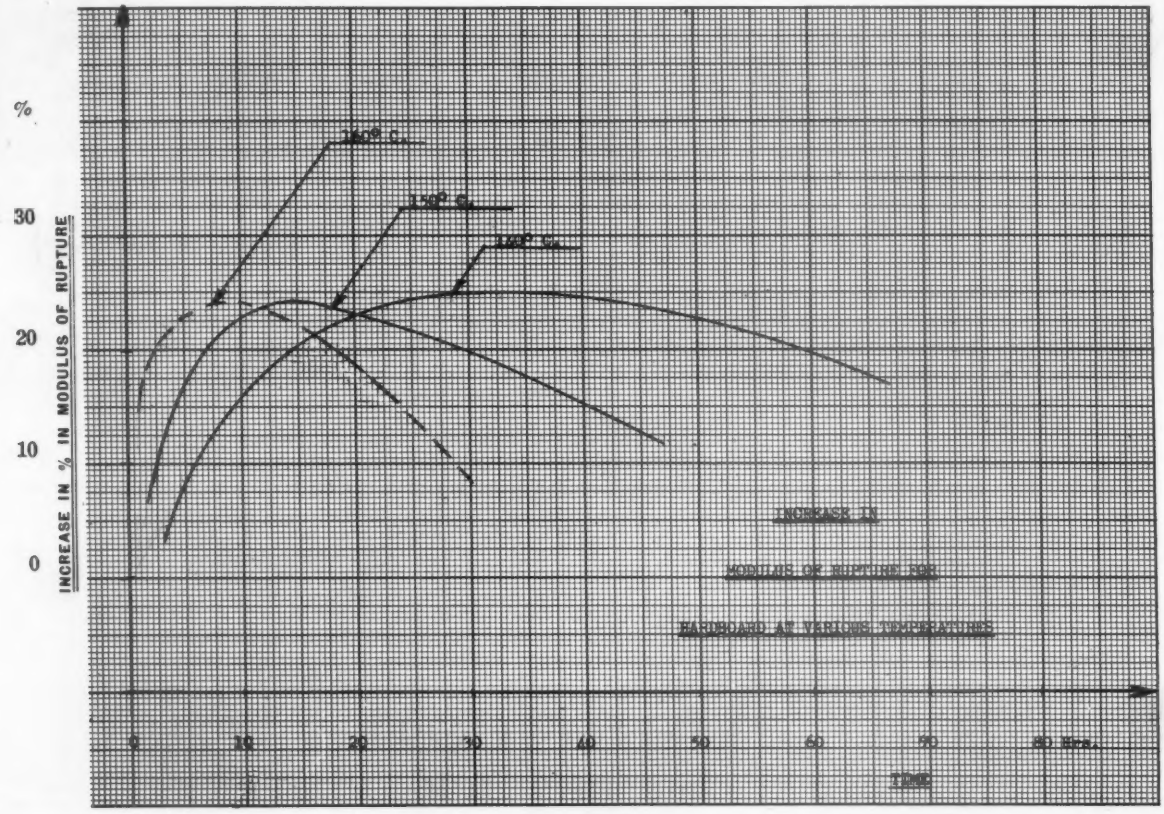

FIGURE 5—INCREASE IN MODULUS OF RUPTURE IN HARDBOARDS

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IS WELL-EARNED BY ALL PRODUCTS THAT WEAR IT

This "ribbon-etch" marks the products made by the longest-experienced manufacturer of cutting tools. And this mark means these 4 things:

1. It means that the product is made of special steel, usually from Simonds' own modern electric steel mills.

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expansion which is not uniform from both sides. To prevent warping it is therefore necessary to humidify the dry hardboard, which is done in chambers where very moist air is circulated. The panels are kept for about four to six hours in this humidifier during which time they pick up about 5 to 6% of moisture. From these humidification chambers the board is taken to saw cutters where the board is cut up to various dimensions.

During the last few years heat treatment of hardboard has become an almost general practice. The heat treatment is based upon the fact that hardboard if heated at elevated temperatures for some time will get a higher breaking strength or Modulus of Rupture. This breaking strength increase is, however, accompanied by a certain increase in brittleness. Hardboard, heat treated to some extent, has been called "carpenter's board," as it lends itself very well to sawing and general carpentry work.

Effect of heat treatment of hardboard has been known for many years. The general effect of time and temperature is shown in Figure 5. The curves indicating the increase in modulus of rupture reach a maximum, and this maximum is earlier reached at a temperature of e.g. 160° C. than at 150° C. or 140° C. After this maximum the modulus of rupture drops rapidly.

The temperatures used in practice range from 120 to 140° C., and the time is about four to five hours. The increase in modulus of rupture usually is about 25-30% under these conditions.

Latest development on the heat treatment of hardboard is a continuous handling of panels from the press. Boards are carried first through a heat treating chamber for about four hours and then into another section with circulating moist air. In this section panels pick up necessary moisture to get stabilized for regular atmosphere.

This continuous handling of boards has been mechanized to an extent that practically no labor is required from the moment the panels emerge from the press until they reach saw cutters.

The high degree of mechanization that characterizes these hardboard plants makes overall labor requirements small. Power consumption for the full operation of such a plant is also quite low. Some plants reach as low as 450 kwh per metric ton, i.e., only about 400 kwh per 2,000 ton. This power figure covers all electric power from the moment the logs are handled until the finished board is stacked.

Insulating Board

For insulating board the pulp requirements are quite different. While hardboard stock must be free, insulating board stock should be sufficiently slow to give necessary self-binding effect. Asplund pulp is, therefore, refined to reach a suitable range of freeness.

Two plants in Sweden making insulating board use 100% refined Asplund pulp for their board, while six others blend more or less refined Asplund pulp with groundwood or groundwood screenings.

The refining of Asplund pulp is carried out in a continuous type of refiner. The roll as well as bedplates are made of Basalt-Lava. Refining takes place at comparatively high density, from 5 to 8%. Power consumed in refining is about 200kwh per ton, and due to high consistency the temperature of stock rises quite high.

Handling of stock for insulating board manufacture is similar to the system used for hardboard. The sizing, however, is carried out with rosin instead of paraffine wax.

The wet machine is different in many respects. As stock is slow it means that water is not drained off as easily as for hardboard. Press rolls are more delicate to handle. Any excessive pressure will cause "crushing" of the sheet.

Wet machines for insulating board vary in width from 8 to 12 feet, which are also standard widths in the U. S.

Felt presses are used for insulating board as well. In some instances 58% water content has been reached, i.e., 42% dry fiber and with suitable suction boxes an even lower water content can be reached. The lower the water content the better heat economy is obtained in the dryer.

Drying takes place in dryers of similar construction as used here.

Boards from the dryer need no passage through a humidifier because moisture absorption from the air does not cause any appreciable expansion.

Besides regular ⅛ and 3/16 in. hardboard and ½-in. insulating board a number of other boards are manufactured, such as semi-hardboard and insulating board of a caliper of only ¼-in.; also low-density board is made.

Semi-hardboard is made in a press using spacers, i. e., square iron bars located at sides of press plates so thickness of the board to be produced can be pre-determined.

While regular hardboard has a specific gravity of approximately 1.0, semi-hardboard has a specific gravity varying from 0.65 up to 0.80. For regular insulating board it is about 0.24.

As mentioned previously, growth of the Swedish wallboard industry has been very rapid, and considering the population, quite impressive. Although most products are consumed domestically there is now such demand for these products on the export market that most mills are expanding. Shortage of building materials prevailing in Europe and the many uses to which wallboard can be put have substantially increased potentialities of these materials.

It is therefore quite likely production of wallboard will continue to increase considerably.

FRANK J. HOAR, Vice President and General Manager of the G. D. Jenssen Co., Inc., which developed the Jenssen acid tower system for both acid making and recovery in the sulfite industry and has been identified with mill design and other improvements in mill processes. Headquarters are now at 363 Eastern Blvd., Watertown, N. Y.
Mr. Hoar, until he recently took over his duties with the Jenssen firm, was with Stebbins Engineering & Mfg. Co. and had served as its Midwest representative and formerly as Manager of Canadian Stebbins Eng. & Mfg. Co. He resides at 117 Ward St., Watertown. He is a graduate of Clarkson College of Technology.
J. D. (Jack) Jenssen, founder and president of the Jenssen Co., lives in New York City.

Lundberg Is Director Of G. D. Jenssen Co., Inc.

A. Halvar Lundberg, prominently connected with design and development of large pulp and paper industries on the Pacific Coast since 1926, has been named a director of G. D. Jenssen Co., Inc., according to announcement by J. D. Jenssen, president, and Frank J. Hoar, vice president and general manager.

Mr. Lundberg, whose offices are in the Textile Tower, Seattle, has been associated with G. D. Jenssen Co. since 1924 and has been its west coast representative for 20 years.

Born in Sweden and a graduate of Technology College of Norrkoping in 1915 as a chemical engineer, he has been in research and development work with Swedish companies, and later with Canadian mills before moving to Seattle.

He is author of many articles on the sulfite industry, including an article on acid making published in this magazine in 1943-1945 issues which is to eventually appear in book form.

Puget Sound Pulp's Alcohol Production

Operations of the Puget Sound Pulp & Timber Co. plant which produces 190-proof industrial alcohol from sulfite pulp mill waste, have been maintained at the rate permitted by pulp manufacturing operations. Alcohol production amounted to 1,204,818 gallons in the first nine months of 1946. Net sales totaled $368,214.

Operation of the plant was begun March 2, 1945. All sales through September, 1945, were made to the government on a cost-plus basis. Since that time alcohol has been sold through private channels.

Strathmore Gives No Birds, But "Eagles"

In prewar years the Strathmore Paper Co., West Springfield and Woronoco, Mass., presented turkeys to employees at Thanksgiving time.

This time they made it a check instead, with a message from Horace A. Moses, chairman of the board: "This year with most of our young men home again we have special cause for gratitude. Let us not forget the price that many families in our land have paid that we might enjoy the peace."

One reason for substituting money for turkeys was the thought that many this year "might want to purchase red meat instead of bird."

INCIDENTS FROM SMITHway PRESSURE VESSEL RESEARCH

PROJECT No. 33,117

Nonferrous weld ductility increased from 16% to 40%

IN metallic arc-welding of heavy plates of certain nonferrous metals—phosphor-bronze, for instance—metallurgists long since found that commercially available electrodes produced welds of uncertain quality.

Such welds tend to be high in porosity, low in ductility, and are subject to cracking.

These three shortcomings severely limited the use of arc welding for the fabrication of pressure vessels which were to be subjected in service to high temperatures and to high pressures.

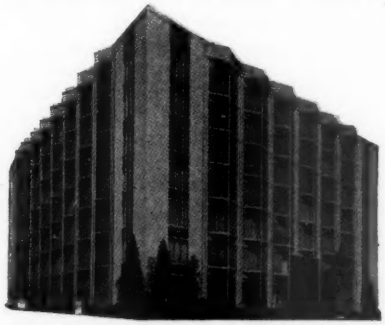
During the late war, however, the ability to weld nonferrous heavy plate satisfactorily became so vitally important that several of the A. O. Smith laboratories began a concentrated study on the subject.

Their answer was relatively simple and conclusive. By three carefully controlled techniques they eliminated porosity, overcame the tendency to crack, and they increased ductility from an average of 16% elongation in a two-inch gage-length to a new high of 40%, *without loss of tensile strength.*

The techniques employed included pre-treatment of the welding electrodes, followed by a closely controlled pre-heating procedure and welding sequence,

and concluding with a unique form of post-welding treatment of each welding pass.

The important fact, however, is that through immediately available integrated research, another pressure vessel fabrication problem was solved promptly, successfully, and practically.



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STEEL

(Continued from page 24)

materials it is "very essential to make the tests under conditions which prevail at the actual operation."

Invisible films or protective oxides such as invariably shroud aluminum, he said, may play a role that is dominant in corrosion. He also remarked that 'one of the trickiest things to work with in a lab is an electrical potential."

Jack Ellis's Talk

Mr. Ellis, a graduate of the University of Glasgow and the Royal Technical College in Glasgow, came to the United States in 1924, married an Illinois girl and was engaged in general mechanical engineering and machinery design before he entered this industry as resident engineer of the present Rayonier mill at Port Angeles, Wash., from 1933 to 1936. He was resident engineer at Shelton, Wash., from 1936 to 1945, and is now a veteran engineer in Rayonier's central engineering office at Olympia, Wash.

At the outset of his talk, Mr. Ellis pointed out that Rayonier's experience with corrosion at Shelton, where it is cooking sulfite pulp with ammonia base and disposing of its waste liquor in furnaces on a hill above the mill, is still "limited" and productive of "no definite data as yet." He said his discussion of corrosion was in connection with sulfite pulping in general, regardless of the base used.

"The introduction of stainless steel in this industry has made a great difference," he said, "by reducing maintenance costs, reducing lost time in operations, and also the need of shipping equipment outside the mills for repairs."

Noting the current interest in stainless steel digester linings as a result of the installation now complete of the first digester of this type at an Olympic peninsula mill, he said "it is too soon to predict the life expectancy for metal-lined digesters." He added that one of the questions yet to be answered is whether someone is going to work out a way to replace these linings or whether it will be necessary to install an entirely new digester if or when they wear out. "Metal linings cannot now be cheaply or readily replaced," he said.

"Corrosion is an even more complex process in industrial operation than it is in the laboratory," he said. "There are a lot of catches to a laboratory test. It is practically impossible to reproduce in the laboratory the actual conditions in the sulfite digester where you may have many changes in the chemical constitution of the liquor during the course of the cook and also later in concentrating. At the start of the cook, at the end of the cook and later, the behavier of the liquor is unpredictable."

He pointed out, furthermore, that there is not just one corrosive agent to consider, but many, quoting chemists to the effect that these include sulphuric acid, SO_2, SO_3, acetic acid and several others.

"We certainly can't base conclusions on just one test of each specimen of stainless steel or other alloy and one must be very careful in making a laboratory test," said Mr. Ellis. "We once tested three pieces of No. 317 (American Iron & Steel Institute classification number) 16-guage sheet stainless steel in the same bath and at the same time. One showed a 350% higher corrosion rate than the other two.

"If Professor Tartar had been there, he might have pointed out some obscure precaution we failed to take or some strange condition that caused this great difference, but to us it is still a mystery."

Mr. Ellis contended that the A. I. & S. I. classification numbers were no longer "good enough" and that "lower No. 317 was just the same as a higher No. 316." These are the type numbers of stainless steel most in demand for conveying or handling concentrated waste sulfite liquor but they are also comparatively rare types and hard to get.

"Instead of ordering a .10% carbon maximum for stainless steel, it is now advisable to order not over .06% for such purposes as this would be used," he said. "And likewise, instead of ordering 16 to 18 chromium, it has now become necessary to order, say, from 16½ to 17½."

Examples of Corrosion

His recalling of strange and unpredictable examples of corrosion in the Rayonier mills were heard with obvious keen interest by his audience.

"One time we installed a high nickel, low chrome shaft sleeve for a Jenssen acid system, instead of the orthodox low nickel, high chrome type," said Mr. Ellis. "It worked out fine, but when we tried to do the same thing with the impeller, it didn't work out and was unsuitable. We don't know why.

"Another time we used No. 317 stainless steel for pipelines discharging waste liquor into headboxes and also for the headboxes themselves. The type 317 steel for each was manufactured at the same time from the same steel by the same fabricator. Yet the pipeline showed only slight etchings when some of the headboxes were quite corroded. The same alloy was exposed to the same corrosive agent. The only explanation for the variation that I can think of is that there was possibly more aeriation in the headboxes."

Mr. Ellis recalled an occasion when No. 316 or No. 317 steel was planned for a piping manifold with a lot of branches carrying concentrated liquor, but neither were available.

"As a temporary measure, we used copper pipe and bronze fittings and commercial brass valves but failed to specify stainless steel trim. We thought it would last only a few months. The thin-walled copper pipe, surprisingly, was the least affected and no one expected the brass to stand up, but it did very well."

Mr. Ellis warned against doing business with fabricators who might be careless or inaccurate in handling orders or with whom stainless steel is just an unimportant sideline, "such as soda fountain fabricators."

"For a fabricated pipe fitting handling blow pit waste liquor, we ordered No. 316 steel. We were welding leaks every few days until we finally found that a few sheets of No. 302 high carbon steel had been mixed with the No. 316.

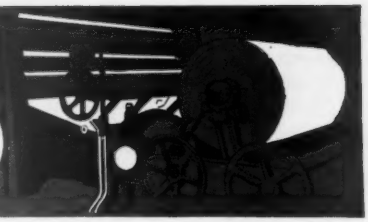
"Another time we ordered a woven wire screen to be made of No. 316 steel. We later discovered that the wires in one direction were corroding while the wires in the other direction were holding up. The corroded part turned out to be types No. 302 or 304.

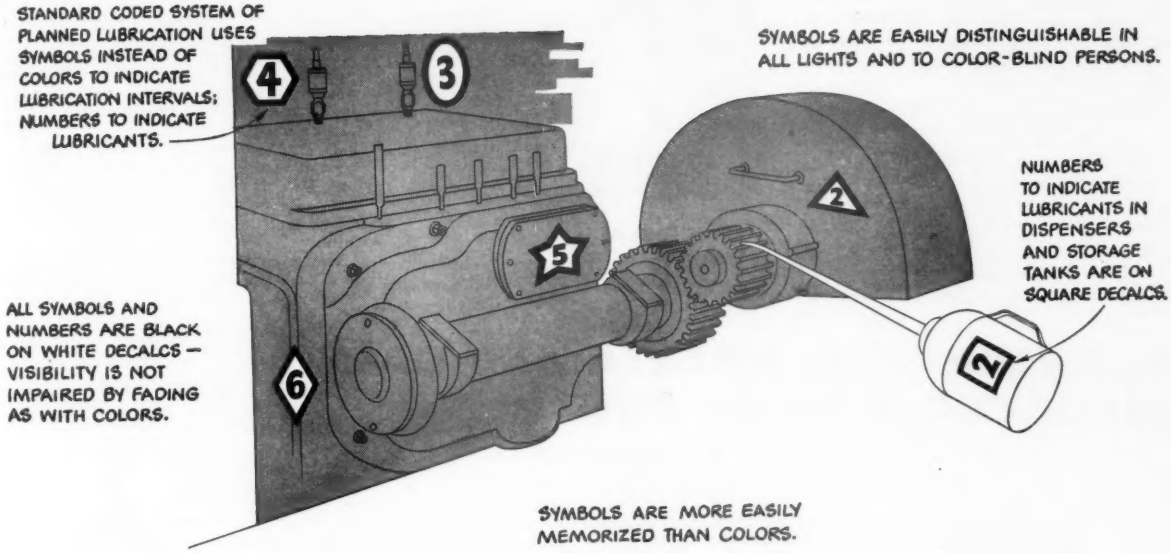
"There are lots of stainless steels which are not the least bit suitable for many chemical pulp mill uses." concluded Mr. Ellis. "Lots of us used to be careless when we specified the types of stainless steel we wanted. We learned our lesson. In fabricating plants and mills the types of stainless steel should always be clearly marked and segregated. The substitution of No. 302 or No. 304 for 316 or 317 can be very costly to the user."

During the question period, it was brought out that mills are really faced this two problems as far as steel alloys are concerned: (1) determining what exact type they need, and (2) how and where to get it commercially.

Mr. Barrett, however, predicted that steel and other industries would make tremendous strides in the next few years—"you are going to see a

STANDARD ENGINEERS NOTEBOOK

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Free coded marking system stops lubrication mistakes

Here's a new coded system of planned lubrication developed by Standard of California Fuel and Lubricant Engineers for operators in the Seven Western States. It will minimize breakdowns and maintenance costs wherever industrial machinery is used and lubricated.

By employing symbols instead of colors to indicate lubrication intervals, mistakes caused by color-blindness are completely eliminated...and chances of errors due to colors fading or changing appearance under different lighting conditions are avoided, too.

The symbols on decalcs indicate lubrication intervals; numbers inside the symbols indicate lubricants to use.

Standard Fuel and Lubricant Engineers will install the Standard Coded System of Planned Lubrication in your plant at no charge. Decalcs, record charts for each machine, everything needed will be supplied absolutely free.

For this service or lubrication help of any kind in the Seven Western States, call your local Standard Representative in that area or write 225 Bush Street, San Francisco, California.

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revolution in those industries, and development of many new alloy high strength steels."

It was also brought out that there is "no real criteria" today for determining needs as there is so much variance between mill operations, inconsistencies due to temperatures, pressures and, source of raw materials, as well as inconsistencies of alloys available.

Mr. Chase mentioned that remote and unexpected factors often determined the rate of corrosion or ability of steels to stand up, such as whether mill logs were rafted in sea water or whether soft breezes off the salt seas passed through the pulpwood forests.

A discussion ensued as to what effect stress had on corrosion. Generally, it was said that corrosion was accelerated at the point of stress in curved metal or where metal is held down or in place, but sometimes rough edges rather than stress could be the real cause of corrosion.

Asked whether he had to take stress "into account" at the Shelton mill, Mr. Ellis replied: "Not any more than in any other piping."

HENRY E. BECKER, author of the Shibley contest paper.

Canadian Meeting Set For Jan. 29-31

Annual sessions of the Canadian Pulp and Paper Association will be held at the Mount Royal Hotel, Montreal, on January 29, 30 and 31.

Papers so far arranged for will cover such subjects as slime control, newsprint manufacture, uses for kraft pulp, alkaline pulping research, talloil, brown stock refining, a modern sulfite layout and sulfite acid plant operation, sulfite bleaching, electric motors, paper machine drive, and use of British disintegrator for evaluating pulp.

The sulfite committee has allotted a session to the operation of indirect heating systems and the newsprint committee plans to discuss the double suction couch and slime control in newsprint mills.

The engineering committee has chosen to discuss the layout for an ideal groundwood mill.

DETERMINATION OF BETA AND GAMMA CELLULOSE IN WOOD PULP

A Shibley Contest Paper

By Henry Edwards Becker

Research Dept., Soundview Pulp Co., Everett, Wash. (presented at TAPPI meeting, Everett, Dec. 3).

Alpha, beta and gamma cellulose were first recognized as definite fractions of wood pulp cellulose by Cross and Bevan in November, 1906 (1) At that time, they described an analytical method for estimating the amounts of alpha cellulose and they defined the three terms in a general way:

Alpha cellulose: Insoluble in 17.5% sodium hydroxide.

Beta cellulose: Soluble in alkali, reprecipitated by acidification.

Gamma cellulose: Soluble in alkali, not reprecipitated by acidification (2).

Most all definitions are similar to the first, with the addition of a phrase designating the method or methods to be used for analysis added in some cases. Staudinger, Dorr, and others (3) have determined that alpha cellulose consists of macromolecules of Degree of Polymerization 200 and more, the beta fraction has a D.P. from 10 increasing to 140 to 200, and the gamma cellulose has a D.P. up to 10. However, to define alpha, beta and gamma in terms of D.P. would be of academic interest only.

Soon after Cross and Bevan described the terms, a gravimetric method for the determination of beta and gamma cellulose came into general use. The beta cellulose being precipitated, filtered off through a fine cloth filter, washed, scraped from the cloth, dried and weighed (4). Not a very precise method in the light of present day procedure.

Other methods of beta and gamma estimation were presented by workers in the field of cellulose chemistry. Schwalbe and Sieber, German authorities, report a volumetric method for beta and gamma estimation (5). This method, based upon the oxidation of the organic material with potassium dichromate in sulphuric acid, has been modified by various workers in an attempt to arrive at a method that will fill the requirements of an ideal determination.

An ideal determination, in my opinion, should:

1. Be accurate,
2. Be reasonably rapid so that it can work into a control schedule.
3. Require simple technique of manipulation, and
4. Require everyday, common laboratory equipment.

It is with the above requirements of an ideal determination in mind that this work was done.

Gravimetric determinations of beta and gamma cellulose are used today by many laboratories. The U. S. Army Specification No. 50-11-100, "Cellulose, Wood Pulp," calls for a gravimetric determination. TAPPI Standard T 429-m44, "Alpha-Beta and Gamma Cellulose in Paper" includes a gravimetric procedure (TAPPI has not issued a standard for determining beta and gamma cellulose in wood pulp) Doree' (4) and others list gravimetric determinations.

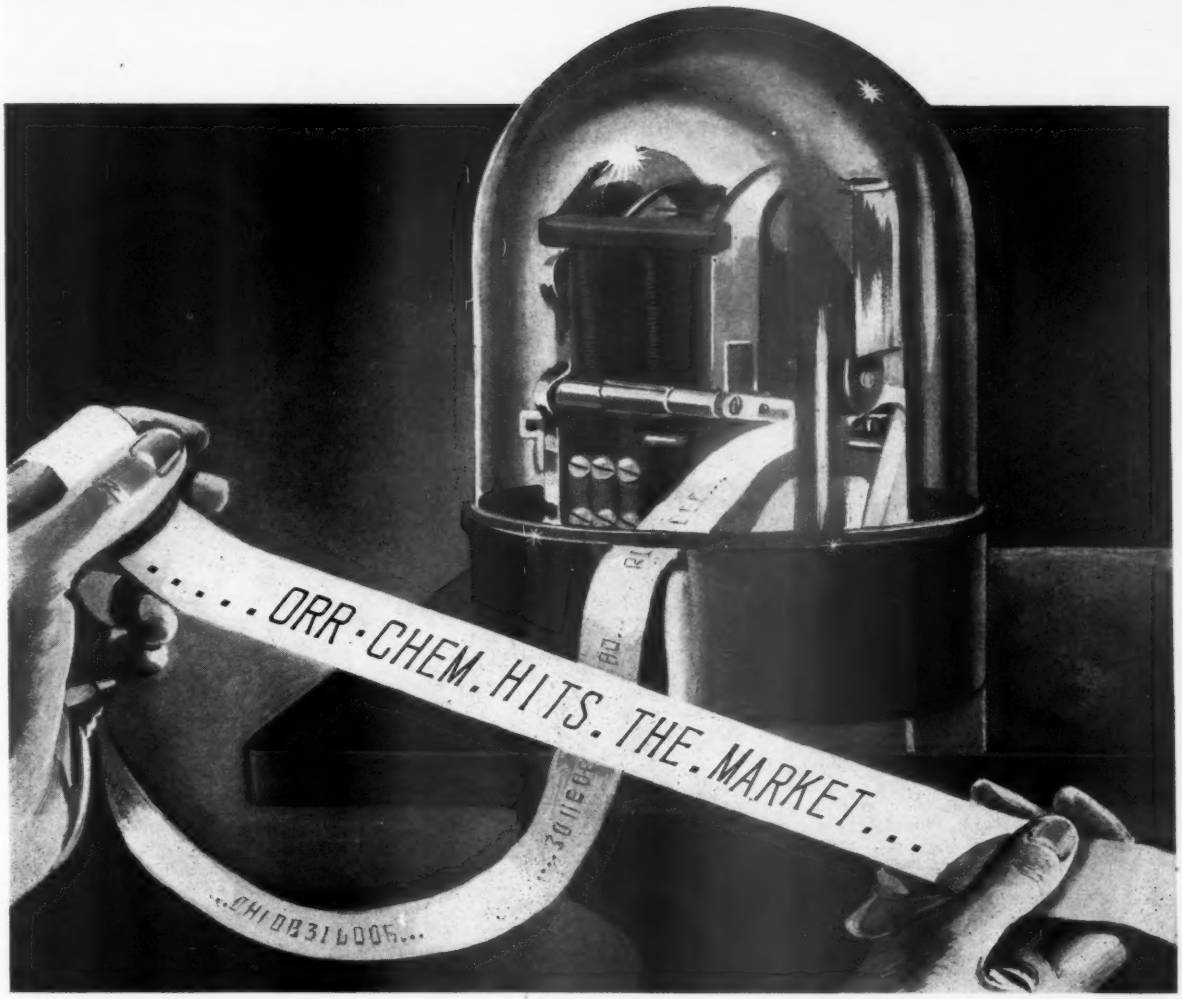
Essentially, the gravimetric method is the same as it was when introduced, calling for the coagulation and precipitation of the beta fraction, filtering the precipitate off by means of a tared filter paper, washing, drying, and weighing. The gamma is taken by difference between the total % alpha cellulose plus beta cellulose and 100%. Although the gravimetric method fulfills most of the requirements of the ideal test, it is not accurate. For example, if a laboratory has standardized upon a Whatman No. 40 filter paper to use in the separation of the beta cellulose, the test results will give apparent accurate results. However, if a Whatman No. 42 filter paper is used, the apparent beta cellulose content will increase about 1%, with a corresponding decrease in the apparent gamma content. This is due no doubt, to the greater filtering efficiency of the Whatman No. 42. In my opinion, the gravimetric determination of beta cellulose is an empirical test, due to its dependence upon a standardized filter, and is not accurate. Also, the control testing schedule that will allow time for corrections of ash, extractive material, etc., present in the pulp sample is a rarity, as a consequence, frequently the calculations for alpha, beta and gamma cellulose are made without considering these extraneous materials present. This means that the alpha, beta and gamma figures on a given sample of pulp are immediately in error by about 0.5% when the gamma is calculated by difference. (The total error due to the amounts of ash, extractive material, etc.)

Volumetric Beta and Gamma Determination

The volumetric beta and gamma determination will overcome the inaccuracy of the gravimetric test, and still fulfill the requirements of the ideal determination. However, it is necessary to study the determination and adjust each step so that a technique is developed which will give reproducable results.

A study of the absorbtion of gamma cellulose by various filtering media during the beta separation was made to determine which method of filtering was the best. Various workers have suggested several methods of filtering, each claiming superiority for one or another filtering media. Objections to some filtering media include:

1. The filtering media absorbs considerable quantities of gamma cellulose, and gives a resultant erroneous test.
2. The filtering media is slow in filtering rate, giving an abnormally long test time.
3. The filtering media is not reliable when removing coagu-



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lated beta cellulose. It may, in one case, remove the beta, and for a duplicate sample and with a duplicate (presumably) filter, allow some beta to go through. This has been found to be true with fritted glass filters.

4. The manipulation of the filter in the cleaning operation is either lengthy or involved. For example: the cleaning operation of the alundum and of the fritted glass filter.

An investigation was made to determine which is the most reliable filtering media. Filter papers and alundum crucibles were eliminated as far as filtering gamma solution is concerned, due to the fact that they absorb considerable quantities of the gamma cellulose and due to the slow filtration rate.

Fritted glass crucibles show that they do not absorb any appreciable amount of gamma cellulose, however, further tests have shown that the filtering characteristics of the fritted crucibles are not constant, even for the same porosity. A test, in duplicate, gave a gamma of 8.91% when filtered through a medium porosity fritted crucible. The duplicate gave a gamma of 9.24%. The former filtrate was clear and the latter filtrate was cloudy, leading one to believe that some beta had passed through the filter.

Our investigation has shown that the Gooch crucible with asbestos, is apparently the most reliable and one of the easiest to prepare. The investigation has shown that the gamma cellulose absorbed is negligible. The Gooch crucible with asbestos can be made up just prior to the filtration, since it is unnecessary to dry it. Cleaning the Gooch is also very simple. The above work substantiates that reported by Lea (6).

The mechanical technique of the volumetric determination must also be adjusted to:

1. Eliminate any undue concentration of the gamma solution because of evaporation of the solution while coagulating the beta cellulose.

2. Eliminate "bumping" while boiling the oxidizing solution.

The concentration of the solution is controlled by coagulating the beta cellulose in a 500 ml. Erlenmeyer flask fitted with an air condenser. The "bumping" is eliminated by the use of glass beads in the oxidizing flask, along with constant agitation until free boiling takes place.

After the technique of manipulation is satisfactory, the determination must be developed to give chemical accuracy. For example: in the determination of beta and gamma cellulose as outlined by several workers (5, 6), the beta cellulose is precipitated by acidifying the solution with acetic acid. Schwalbe (5) says hydrochloric or "better acetic acid." It was found that the use of acetic acid will give erratic results. It was felt that there may be a slight oxidation of the acetic acid with a resultant reduction of potassium dichromate. However, further investigation has shown that acetic acid is very resistant to oxidation by potassium dichromate—sulphuric acid solution. The erratic results are undoubtedly due to impurities in the acetic acid. It is the oxidation of these impurities that cause the erroneous results in the gamma determination.

If one wanted to use acetic acid, it would be necessary to redistill the acid over chromium trioxide as suggested by Meesook and Purves, who use acetic acid with chromium trioxide in the preparation of an oxidizing solution used for preparing oxycelluloses (9). [Baker C.P. (A.C.S. Standard) glacial acetic acid was used for the investigation in this work on beta and gamma cellulose.]

Hydrochloric acid will also reduce potassium dichromate if it is present in the oxidizing flask. Sulphuric acid has been found to be one acid that is very satisfactory to use when precipitating the beta cellulose. In the following tables, the ml. of ferrous ammonium sulphate necessary to reduce the excess potassium dichromate is given. The same solutions and experimental conditions were used in Table I. In one case the sodium hydroxide was neutralized with acetic acid and in the other case, the sodium hydroxide was neutralized with sulphuric acid. As can be seen, the results with acetic acid are erratic.

TABLE I

Sulphuric Acid	*Acetic Acid*
12.15 ml. ferrous amm. sulphate	11.20 ml. ferrous amm. sulphate
12.10 ml. ferrous amm. sulphate	11.60 ml. ferrous amm. sulphate

In another series, neutralization with hydrochloric acid, acetic acid and sulphuric acid were compared. As is to be expected, the hydrochloric acid and acetic acid give erratic results due to oxidation, whereas the sulphuric acid gives more reliable titrations. For this run, all conditions are constant.

TABLE II

	ML. FERROUS AMM. SUL.	
H_2SO_4	HCl	CH_3COOH
22.31	19.97	20.56
22.37	19.80	21.50
22.39		21.95
22.32		21.90

The possibility existed that some beta cellulose could be hydrolyzed to a soluble form (where it would appear as gamma cellulose in the gamma oxidation), while the precipitation with sulphuric acid and the coagulation with heat took place. However, an investigation has shown that there is no hydrolysis when the beta is precipitated at a pH of 6.7, which is well above the range of any hydrolytic action by sulphuric acid, or at a pH of 2.0, which is more acid than the normal phenolphthalien end point will allow.

The indicator used to determine the end point of the oxidation back titration deserves special mention. The potassium ferricyanide indicator end point, frequently used for this type of titration is hard to see. A method presented by the Analysis Committee of the Central Laboratory of the Cellulose Industry in Sweden (7), calls for the use of ferrion sulphate as an indicator. Ferrion sulphate is not listed in any organic chemistry text available to me, nor is it listed in either Lange's or the Chemical Rubber Handbook or in the Eastman Kodak Catalogue of organic chemicals, so I am not aware of what "it is."

Lea (6) suggests the use of sodium diphenylamine sulphonate solution as the indicator. It is easily prepared from barium diphenylamine sulphonate (E. K. No. 3104) and is stable over periods of several months. The end point, using this indicator is superior, giving a color change from red to blue to blue green (just prior to the end point), to a very definite green. The end point is very sensitive and very sharp for this type of reaction. TAPPI also recommends this indicator.

Procedure

A detailed description of the determination of beta and gamma cellulose is as follows:

Definitions

Beta cellulose is that portion of the pulp which dissolves in the alkaline solution under the conditions imposed in the alpha cellulose determination (8), but which is reprecipitated on acidification of the alkaline solution.

Gamma cellulose is that portion of the pulp which dissolves in the alkaline solution under the conditions imposed in the alpha cellulose determination (8), and remains in solution after acidification of the alkaline solution.

Test specimen: The test is run on that portion of the filtrate from the alpha cellulose determination previous to the addition of the acetic acid to the alpha cellulose pad. This solution is made up to 1 liter in a volumetric flask by addition of distilled water.

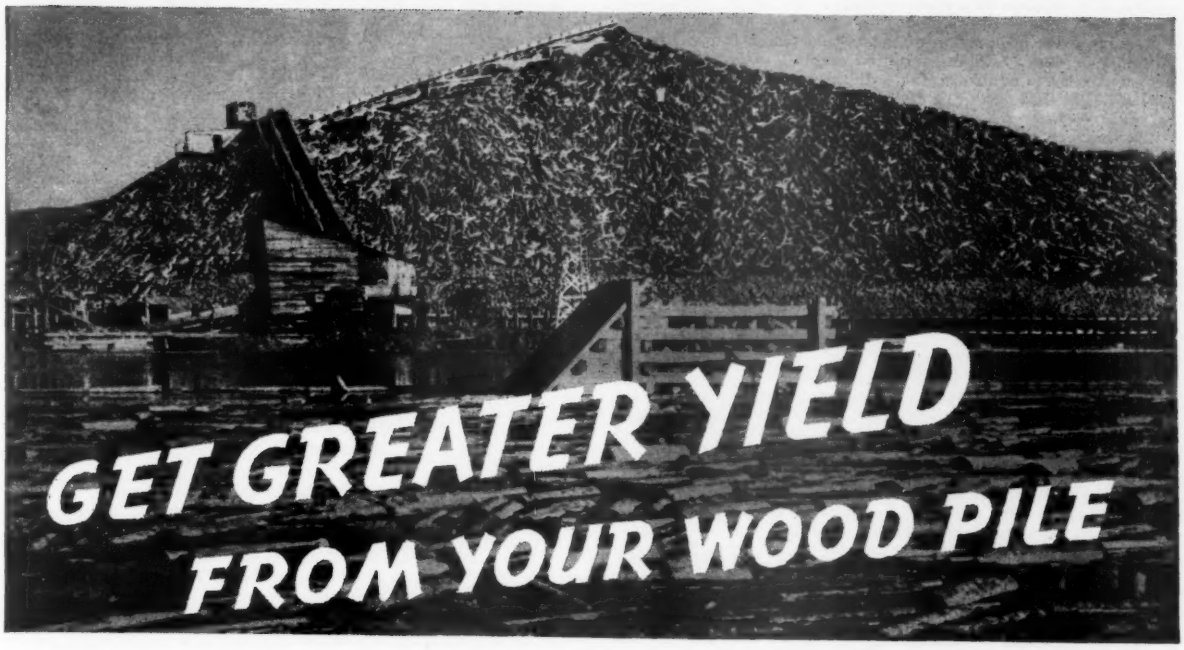
Reagents: Potassium dichromate—90.0000 gm. per liter.
Ferrous ammonium sulphate—159.9 gm. per liter (159.9 gm. salt, 5 ml. conc sulphuric acid, distilled water to 1 liter.)
Sulphuric acid—50% solution by weight.
Phosphoric acid—85%.
Sodium diphenylamine sulphonate—0.32 gm. barium diphenylamine sulphonate (E.K. No. 3104) dissolved in 100 ml. of water. Add 0.5 gm. of sodium sulphate. Filter off the precipitated barium sulphate.

Procedure

Blank: Add by means of a pipette, 5.0 ml. of the standard potassium dichromate solution to 100 ml. of a solution of the same strength sodium hydroxide as that in the test specimen. (75 ml. of 17.5% NaOH diluted to 1000 ml.). Add 50 ml. of concentrated sulphuric acid, cool slightly, add 150 ml. of distilled water and cool to room temperature. Add 10 ml. of phosphoric acid and 0.5 ml. of sodium diphenylamine sulphonate indicator. Titrate with the ferrous ammonium sulphate solution.

Beta plus gamma cellulose: Pipette 100 ml. of the test specimen into a 500 ml. Erlenmeyer flask containing 5 or 6 glass beads. Add 5 ml. ot fhe standard potassium dichromate solution by means of a pipette. Add 50 ml. of concentrated sulphuric acid to the above. Bring the mixture to a boil over a flame and boil for 10 minutes, to oxidize the organic material present. It is important that the contents of the flask be kept in motion until there is free boiling, to avoid bumping. At the completion of the boiling period, cool slightly and add 150 ml. of distilled water. Cool to room temperature. Add 10 ml. of phosphoric acid and 0.5 ml. of the sodium diphenylamine sulphonate indicator. Titrate with ferrous ammonium sulphate to the first green. The indicator color charge is from red to blue to blue green (just prior to the end point) to green. The endpoint is very sharp.

Gamma Cellulose: Remove a 100 ml. portion of the test specimen by means of a pipette. Titrate this portion with 50% sul-



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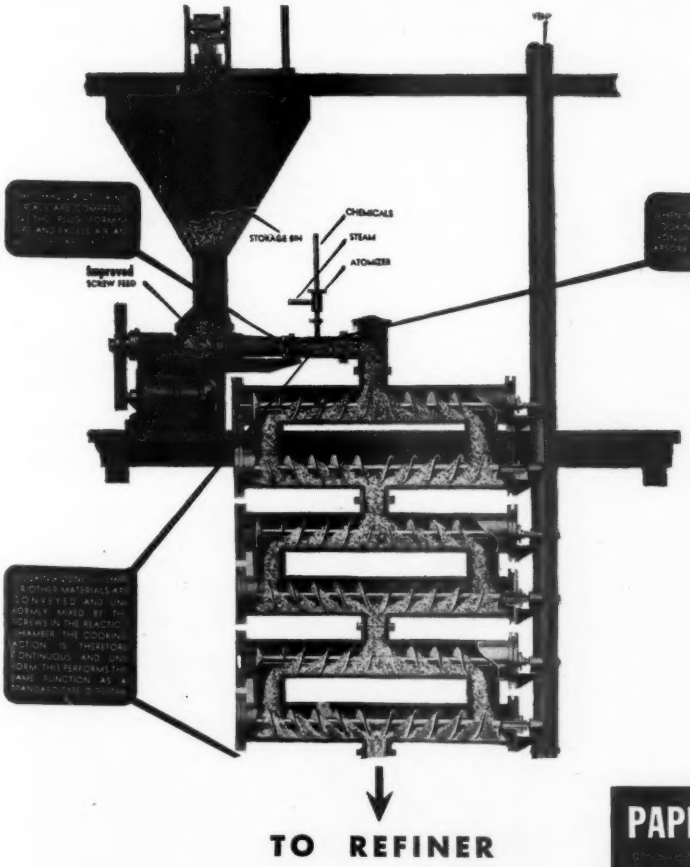

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phuric acid solution to a phenolphthalien end point. Record the ml. of acid required.

Remove a 400 ml. portion of the test specimen into a 500 ml. Erlenmeyer flask. Add the required amount of 50% sulphuric acid necessary to neutralize the sodium hydroxide present. This will be four times the ml. of acid required to titrate the 100 ml. sample. After the addition of the required amount of acid, equip the flask with an air condenser and place in a hot water bath for 30 minutes to coagulate the beta cellulose. Cool the flask to room temperature and filter through an asbestos pad (protected by a Witt plate) in a Gooch crucible, into a dry filter flask using suction. It is not necessary to filter more than 250 ml. If the filtrate is not clear, the asbestos pad has not retained all of the beta cellulose and the filtrate must be refiltered. This trouble will not occur if the Gooch is properly prepared. Any moisture in the asbestos pad can be removed by discarding the first few ml. of filtrate. (Filter a few ml., then tip the filter flask and let the filtrate run out the side arm.)

Pipette, from the fitter flask into a 500 ml. Erlenmeyer flask containing glass beads, 100 ml. plus the amount equivalent to the ml. of acid required to neutralize the NaOH in 100 ml. of the original test specimen. This total will give a sample that is equivalent to 100 ml. of the test specimen, less the beta cellulose.

Pipette into the above solution, 5.0 ml. of potassium dichromate and add 50 ml. of concentrated sulphuric acid. Boil, cool, dilute and cool as for the beta plus gamma determination. Add 10 ml. of phosphoric acid and 0.5 ml. of indicator solution. Titrate with ferrous ammonium sulphate.

Calculation

1 gm. potassium dichromate = 0.1375 gm. cellulose.
1 ml. of standard potassium dichromate solution is equivalent to (90) (0.1375)/1000 = 0.012375 gm. cellulose.

K_1 = Ml. of ferrous ammonium sulphate equivalent to 5.00 ml. of the standard potassium dichromate. This is the blank titration.

K_2 = Factor 61.875 K_1. This factor is derived below.

Tit'n = Ml. of ferrous ammonium sulphate equivalent to the portion of the 5.00 ml. of potassium dichromate not used to oxidize the cellulose. (Excess dichromate)

Ml. of potassium dichromate to oxidize the cellulose = $5\text{-}5/K_1 \times$ tit'n

This represents (0.012375) $(5\text{-}5/K_1 \times \text{tit'n}) = (0.061875)(1\text{-tit'n}/K_1)$ gm. cellulose.

Since the aliquot portion of filtrate is 1/10th of total: gm. cellulose in total = (10) (0.061875) $(1\text{-tit'n}/K_1) = (0.61875)(1\text{-tit'n}/K_1)$

$$\%\ \text{cellulose in total} = \frac{(100)\ (0.61875)\ (1\text{-tit'n}/K_1)}{\text{B.DD. wt. of pulp}} =$$

$$\frac{(61.875/K_1)\ (K_1\text{-tit'n})}{\text{B.D. wt. of pulp}} \quad \text{or}$$

$$\%\ \text{cellulose in total} = \frac{(K_2)\ (K_1\text{-tit'n})}{\text{B.D. wt. of pulp.}}$$

Beta cellulose = % beta plus gamma — % cellulose.

Report: % beta and % gamma cellulose to the nearest second decimal. This determination, when run on the filtrate from the standard T.A.P.P.I. alpha determination, gives what appears to be accurate results. Four samples of pulp have been used for experimental runs. The test rsults are listd in Table III.

TABLE III

Sample	No. of Tests	Alpha %	Beta + Gamma Avg. %	B. + G. deviation ind. test from avg.	Gamma Avg. %	Gamma deviation ind. test from avg.	Beta by difference %	Total % Alpha + Beta + Gamma
1	4	89.17	10.73	0.10%	8.90	0.10%	1.83	99.90
2	3	86.47	13.38	0.01%	9.31	0.05%	4.07	99.85
3	4	88.99	10.43	0.05%	8.84	0.16%	1.59	99.42
4	4	92.18	7.59	0.08%	5.22	0.05%	2.37	99.77

You will note that the total of the alpha plus beta plus gamma in the above does not equal 100%. This difference is due to the presence of salts (determined by ashing) and the presence of extractive material in the original pulp sample. Sample No. 3 in Table III, for example, had the following analysis:

Ash	0.143%
Ash in alpha pad	0.04%
Ether extract	0.234%
Total cellulose	99.42%
Total material accounted for	99.75%

0.25% is due to experimental error, unextracted insoluble waxes and high molecular wt. soaps not soluble in ether, etc.

A time study of the determination, when used for routine analysis was made. The time for each operation was taken (exclusive of calculating results) and it was found that four samples could be run in two hours and 23 minutes without sacrificing any precision. (Table IV.)

If all solutions are made up and ample equipment is in place for determination, four determinations can be made at one time. The following schedule is satisfactory when running four samples.

TABLE IV

Elapsed time to start of operation (Minutes)	*Operation*	*Time of operation (Minutes each—unless otherwise noted)*
0	1. Make all samples up to volume.	1
4	2. Pipette all 100 ml. samples. (B + G & acid titrations.)	½
8	3. Take 400 ml. samples for beta precipitation.	1
12	4. Titrate acid samples and add required amount of acid.	1
16	5. Place air condensers in place and put in water bath.	1
20	6. Add dichromate to each B + G sample and blank.	2 (lot)
22	7. Add Conc. H_2SO_4 to each B + G sample.	1
26	8. Bring to boil with precautions	2 (lot)
28	9. Boil 10 minutes.	10 (lot)
	10. Prepare 4 Gooch crucibles while boiling.	
	11. Prepare blank. Add acid.	
38	12. Remove boiling solution. Cool 2 min.	3 (lot)
41	13. Add 150 ml. water to each, including blank.	3 (lot)
44	14. Cool 10 min. in water.	11 (lot)
55	15. Remove flasks from hot water bath and cool in water for 20 min.	20 (lot)
	16. During period of operation 15, add phosphoric acid and indicator to B + G samples and blank and titrate with ferrous.	
75	17. Filter off at least 250 ml. of cooled gamma solution.	3
87	18. Pipette 100 ml. + acid equivalent into flask. Pipette dichromate, add conc. acid to each.	8 (lot)
95	19. Bring to boil & boil 10 min.	12 (lot)
107	20. Cool 2 minutes.	3 (lot)
110	21. Add 150 ml. water and cool 10 min.	13 (lot)
123	22. Add phosphoric acid & indicator & titrate.	20 (lot)

143 minutes.
Elapsed time: 143 minutes (2 hr. 23 min.) for four samples.

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OLIVERS at KVP

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COAST SUPTS.

(Continued from page 38)

the year that retiring Coast Chairman Charles Ackley of the Crown Zellerbach mill in Port Angeles is slated to take over the national presidency. Mr. Ackley said the earliest a convention could come to the coast is in 1949, with a Midwest convention slated for next year and one in New Orleans in 1948.

An inspiring address by Matthew W. Hill, newly elected Washington State Supreme Court justice, in which he analyzed and outlined the meaning of Americanism as based on historic documents beginning with the Mayflower Compact, was a highlight of the Seattle convention.

L. K. Smith, manager of PULP & PAPER INDUSTRY, the luncheon toastmaster who arranged for Justice Hill's appearance, recalled some history of the superintendents on the coast, noting that their organization was founded on Dec. 9, 1933, in Seattle and that it held its first convention Dec. 13 of that year in Longview, Wash., with H. Robert Heuer, of Weyerhaeuser Timber Co., as the first chairman.

Mr. Smith praised the secretary-treasurers who have "carried a big load" in keeping the division functioning—H. A. Des Marais, of General Dyestuff Corp., who served four terms; A. S. Quinn, of Stebbins Engineering Corp., who served six, and Mr. Armbruster, now starting his second.

Three of the past chairmen of the Coast division were present at the Seattle meeting—Mr. Heuer, Merrill E. Norwood of St. Helens Pulp & Paper Co., and Anton "Tony" P. Siebers of Longview Fibre Co., who landed in Seattle by plane from the east with his attractive daughter, just in time to deliver a paper he had prepared on cylinder machine operation.

Pulpmakers

In our last issue, we presented the highlights of the pulpmakers' session under chairmanship of General Supt. Bill Coster of Soundview Pulp Co.—the talk by Svarre Hazelquist on his Scandinavian trip (p. 58, Dec. issue) and the Hatch-Holzer paper appraising Pacific Coast pulpwoods (p. 53, Dec.). At this session, Irwin Thieme of Soundview also read a paper on acid making in the sulfite industry by Halvar Lundberg, Seattle chemical engineer. This included parts of the feature article on this subject published in PULP & PAPER INDUSTRY through 1943 and 1944 and which is to be published in book form.

Interpolated in his paper was Mr. Lundberg's warning that the sulfite industry is in "a precarious position" and that "operators cannot sit back any more and accept poor acid and poor pulp as something that cannot be helped in the summer months and warmer water temperatures—the curse of acid making." He raised the question of whether the sulfite industry was holding its own in competition with other branches of pulp and papermaking and warned: "We are challenged and better do something about it."

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Papermakers

In the papermaking session, with the new second vice chairman of the division, H. Rad Russell, of Everett Pulp & Paper Co., in the chair, Bob Petrie, the Coast representative of Black-Clawson, Dilts and Shartle Bros., brought in a new idea in the discussion of refining but treating it as a comprehensive system rather than from the point of view of any individual machine.

Mr. Petrie discussed the uses of Hydrapulpers, Hydrafiners, cycling chests and Miami jordans and noted that the entire stock preparation system now can be placed under the remote control of a single operator from a centrally located control panel and testing station. He compared systems in operation mentioning an installation at the J. R. Booth mill in Quebec, which has means for clearing broke completely before batch cycling refining stage of preparation commences; and one at the Pioneer-Flintkote mill in Los Angeles, where preparing stock from mixed waste paper requiring a minimum of jordaning and a minimum of paper wastage in rejects is in practice.

C. D. Riese, General Electric Co., gave a talk on electric drives for paper machines, in which he wound up his discourse with the welcome announcement that his company expects to have more time to work on custom-built jobs for mills in the future. After the wartime period of emphasis on other activities, he said "GE" is now "interested in the economic application of any pulp or paper mill's equipment and will be glad to be given its problems."

Harkening back to the highly successful first Fall Meeting exclusively held for engineers by TAPPI, in Milwaukee (Nov. issue of PULP & PAPER INDUSTRY), Mr. Riese put himself on record as favoring the organization of an exclusive Engineering section of TAPPI.

Closing this paper session was an illustrated talk on various rubber-

like synthetics, some with superior qualities to rubber, given by W. K. Ball of a Seattle firm. In reply to a question, however, he conceded that natural rubber bonds were still best for paper mill rolls.

Paperboard Makers

The paperboard makers, who so often have felt that they have been "stepchildren" of the various industry meetings held all over the United States, regardless of which area, really came "into their own" in this Seattle meeting, with one of the liveliest meetings of the entire convention.

Harold Quigley, paper mill superintendent at the Crown Z mill in Port Townsend, was the moderator of this session, and ably abetted by Tony Siebers of Longview Fibre, and Charles F. Meagher, of the Fibreboard mill at Port Angeles, both of whom gave papers. They raised a lot of questions from the floor and they were generally answered in the text of these two papers which follow:

CYLINDER MACHINE OPERATION

By Anton P. Siebers
Paper Mill Supt.,
Longview Fibre Co.,
Longview, Wash.

The cylinders are bound with a 14 B&S gauge soft copper wire. The backing is stapled straddle every fourth rod and the top face is stapled in between. In other words the backing is stapled every other rod and the top face every fourth rod.

No deckle strapping of any kind is used on the cylinders. Instead a home made water deckle using a No. 9 Rex spray nozzle is used. This water deckle can be adjusted in and out on each side of the machine about three inches, which means the width of the sheet can be varied six inches. This change can be made on the run in 3 or 4 minutes and is adjustable for any desired feather edge.

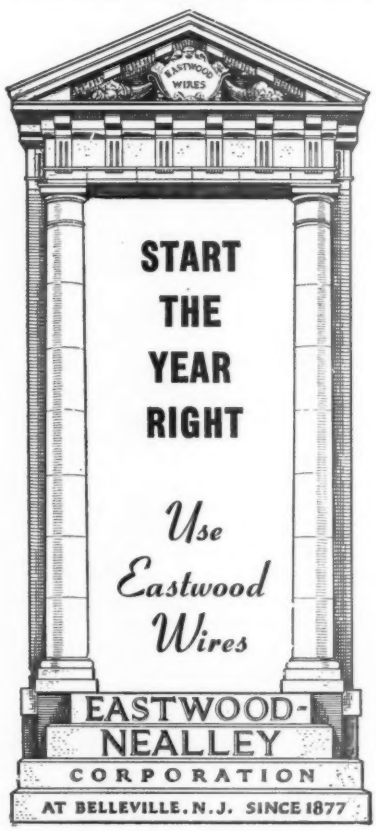
First, the problem of forming the sheet. Our stock is ready, our screening is done, so the next thing we do is form the sheet on the molds. We should talk about the weight which is usually the cause of most headaches. Fifty-pound test liner seems to be the weight we do the most struggling with. We can make a good sheet of 50-pound test liner at a speed of 400 F.P.M. We do have to keep our stock fairly slow at this speed, however, to avoid the sheet slipping on the molds. This gives us approximately 7.15 pounds per mold on each of the seven molds. The consistency going onto the molds runs around 3/10 of 1%. We do not know just what that spells in the process of forming. We are satisfied that the forming starts at the opposite side of the mold. There is a lot of dewatering of the stock that takes place as the mixed volume is forced around to the forming side of the mold, so one may expect to find the consistency around 6/10 of 1% to start the formation, while 3/10 of 1% should be ideal.

How, then, do we get better forming conditions? Do we install larger molds or do we install more of them? In other words, in a case where we are using seven 42-inch molds that gives us approximately 85 inches around the mold to form a sheet, could we assume that a 60-inch mold would give us 30% more forming area and with this additional forming area would we avoid slipping at 10% to 15% higher speed, say 450 F.P.M.? Or would we be in a better position to increase the speed up to 450 F.P.M. by the installation of one additional 42-inch mold? This is a good point for discussion.

Now, I would like to bring up felt condition. Suppose we do get up to 450 F.P.M. and still have a good formation, no doubt we would have a bottleneck in our felts. We think we have a very good felt conditioning device and a good cylinder cleaning device, however, it can do no more than keep our felts clean enough to operate at 400 F.P.M. Could we assume then that a very coarse and stronger felt would be the answer or would it be necessary to install more suction equipment. There is a good chance that both would be required.

We are now working with our felt suppliers on this very problem. However, we are trying to get our suppliers to build a felt to do the job and give us better felt life too. I do believe that we all have a lot to learn about what is the best type of a felt to use, and the felt manufacturer has a lot to learn about what to supply to give us the best results on a given cylinder machine at high speed.

Now let us consider drum roll operation. It seems there was very little known about the value of a drum roll up to 1934. Since then the drum roll has become a very valuable part of the cylinder machine suction as well as pressing equipment. The proper installation of a drum roll replaces all but two of the primary presses. The primary plain presses serve only as a firming of the sheet device. That is, one can help out a Mullen test by using the last two primaries. As for water removal, we find very little difference with or without them used. It may be safe to say that one primary suction press would eliminate the two plain primary presses, produce a better sheet and increase felt life plus a better and safer operating condition. It would seem that drives on the molds would make a great improvement, particularly at higher speed.



Board Machine Clyinder Faces; Water Deckles

By C. F. Meagher
Paper Mill Supt.,
Fibreboard Products Inc.,
Port Angeles, Wash.

This paper is based on the operating experience from a five-cylinder board machine located at Fibreboard Products Inc., Port Angeles, Wash. The machine was put into operation in 1918. The cylinders are 36 inches in diameter by 114-inch face and were covered with a No. 14 mesh backing wire and a No. 50 mesh phospor bronze top face.; The life of these faces varied all the way from six months to nine months.

Naturally we were in the market for some means of increasing the face life so it was decided to try monel. A monel face was in service about a year at which time the cylinder had to be removed for rerodding and rewinding. An electrolytic action had attacked the bronze winding wire and rods.

The next alloy tried was 18-8 type 304 stainless steel. This set of faces was put in service in May, 1935, and operated until Sept., 1944, or 9 years and 4 months. After the first stainless face showed signs of lasting, the remaining cylinders were also covered with the same type cloth, and lasted about the same length of time. All of the stainless faces were sewed using the same stainless wire with a softer temper. When the first stainless face was taken out of service, it was not because the face was gone but because the rods and winding wire were so erroded and filled up with hard scale that we couldn't get proper drainage.

Extra special care should be taken in putting on stainless faces. This is not so important when the expected life is less than a year as a loose face or bad seam will usually last that long. This point was brought forcible to our attention as the replacement for the first stainless face was put on by an inexperienced man. He did not get them on tight enough and he crystalized his sewing wire while sewing the seam. The seam did not hold and had to be patched in several places and the face because it was not tight on the cylinder, wrinkled

and finally cracked. This face was taken out of service after two years.

The fact should be stressed that it is not important to see how fast you can put a face on but how good it can be put on. Care should be taken with each clamp to see that it is pulled up properly. In sewing a seam great care should be taken not to twist or stretch the sewing wire. Our experience has proven that a set of stainless faces put on properly will last longer than nine years whereas a poor job will last only a couple of years.

Interview With Finnish Guest; Others In Seattle

Less pulp may be expected from Finland for American mills in the immediate future, regardless of price, because of fuel and labor shortages. This was the prediction of a Finnish mill executive at the Pacific Coast Superintendents convention, interviewed by PULP & PAPER INDUSTRY.

Travelers from longest distance to the Pacific Coast superintendents convention in Seattle, besides Paavo Hinkajuuri, technical manager of the 280-ton-a-day bleached sulfite pulp mill at Rauma, Finland, known as Rauma Raahe Oy; were also:

Jerry Strasser, vice president of Stein, Hall & Co., New York, and Howard Gerber, traveling out of Chicago for Lindsay wires.

Canadian guests included Claude P. Kelly from Ocean Falls, B. C.; A. J. Saunders and Charles Craig, Victoria, B. C.; and John Guthrie and L. C. Kelly of Woodfibre, B. C., the latter issuing a warm invitation to Americans from below the line to attend future meetings of the new Pacific Coast branch of the Canadian Technical Section.

Mr. Hinkajuuri visited mills in New England and New York as well as the west coast before flying back to Sweden Dec. 17.

"Most modern mills in Finland today are in the sulfate field," said Mr. Hinkajuuri. "This type of mill is using pine and sawmill waste. Such mills are economic in the present fuel crisis, because they get steam from their own soda plants. Alcohol, as a by-product of our own mill and other sulfite mills in Finland, is used as fuel for cars and for beverages."

Mr. Hinkajuuri toured the Coast sulfite mills under the wing of J. E. Heiskanen, former representative of Pulp Bleaching Co. in Finland, who is now a permanent resident of Seattle and still a member of that firm headed by Raymond P. Hill.

Zellerbach's New Plant

Zellerbach Paper Co. has CPA approval for $350,000 expenditures on a new Seattle, Wash., plant to be built on property acquired in 1942.

Chisholm Passes Cigars

No wonder Herb Chisholm, genial advertising manager, Blake, Moffitt & Towne, San Francisco, was walking around with a big grin on his face and passing out cigars one day last month. The occasion was the birth of a 7-lb. 1-oz. son. The newcomer has been named Richard Walter Chisholm.

Hummel-Ross Directors OK Continental Can Deal

Hummel-Ross Fibre Corp. (Hopewell, Va., Kraft Mill) directors have approved acquisition of the company by Continental Can Co., Inc.

Under the proposal, 293,779 shares of Continental Can Co. will be given for the 391,706 common shares of Hummel-Ross Fibre Corp.

A special stockholders' meeting of Hummel-Ross has been called for Feb. 4 to vote on the matter.

Malcolm Otis Makes Swing of Puget Sound Mills

Malcolm J. Otis, resident manager of the Crown Zellerbach mill at Lebanon, Ore., recently made a visit to Puget Sound mills and particularly was interested in viewing the several new big hydraulic log barking plants at those mills.

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Dr. Hanson Keeps Touch Between N. Y. and Berlin

Dr. Arnold Hanson, in charge of company relations for the Brown Company, was in New York City from Berlin, N. H., in December to confer with Downing P. Brown, vice president in charge of sales.

He expects to make regular trips between Berlin and Manhattan to coordinate company relations problems with the office at 500 Fifth Avenue.

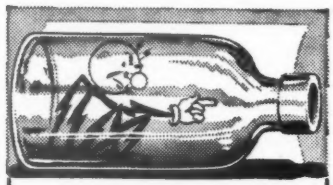
Majority Favored 500 Ream Count

The Waxed Paper Institute, Inc., recently conducted a poll among members as to whether the industry preferred to standardize on the present ream basis of 24 x 36—500 ream count or return to the former 480 ream count. The majority, representing about 75% of the industry tonnage, voted for the 500 ream count and the Institute recommends that all standardize on the 500 ream count.

Paul F. Moore Tours Glassine Mills

Paul F. Moore, president of Westfield River Paper Co., Russell, Mass., is a regular visitor these days to the Glassine Paper Co., West Conshohoken, Pa., which he also heads.

In December he and J. J. Costello, treasurer, were in conference with C. M. Connor, technical director, about plans for 1947. Mr. Moore is kept busy on short-haul trips due to the several operations, at Russell, Conshohoken and Manayunk.



MORE BOTTLENECKS

• "It's a fact. I just get out of one bottleneck and then there's another. Deliveries are still slow on copper, meters, meter sockets, insulators, transformers, etc. That's what's holding me up on extensions and improvements. I hope it won't be long before I get the materials I need to do the job. I want everybody to have service and to have **good** service."

Reddy Kilowatt

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